1947

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Utah State Agricultural Colleg

LOGAN, UTAH

BULLETIN

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UTAH STATE AGRICULTURAL COLLEGE BULLETIN

CATALOG ISSUE

1947-1948

Published by the College

1947

LOGAN, UTAH

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COLLEGE CALENDAR FOR ACADEMIC YEAR 1947-1948

FALL QUARTER

September 8, Monday	First Faculty Meeting.
September 11, Thursday	Aptitude and Other Tests for All New Students.
September 12, Friday	Registration of Former Students.
September 13, Saturday	Registration of All New Students.
September 15, Monday	Instruction begins.
October 13, Monday	Prospective graduates submit applications for candidacy.
November 26, Wednesday	Fall Quarter ends.

WINTER QUARTER

December 1, 2, Monday, Tuesday	Registration. Candidates submit applications for graduation.
December 3, Wednesday	Instruction begins.
December 19, Friday	College closes for Christmas Recess.
January 5, Monday	Classes are resumed.
March 5, Friday	Winter Quarter ends.

SPRING QUARTER

March 8, 9, Monday, Tuesday	Registration.
March 10, Wednesday	Instruction begins.
April 7, Wednesday	College closes for Spring Recess.
April 12, Monday	Classes are resumed.
May 23, Sunday	Baccalaureate Service.
May 28, Friday	55th Commencement.

SUMMER QUARTER 1948

June 7, Monday	First Session begins.
July 16, Friday	First Session ends.
July 19, Monday	Second Session begins.
August 20, Friday	Second Session ends.

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A. W. Chambers	Smithfield
D. A. Skeen	Salt Lake City
Ella V. Reeder	Brigham City
Heber Bennion, Jr., Secretary of State (ex officio)	Salt Lake City
W. W. Gardner, President, Alumni Association (ex officio)	Salt Lake City
Russell E. Berntson, Secretary-Treasurer	Logan

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R. H. Walker	Director, Agricultural Experiment Station and Dean, School of Agriculture
H. Wayne Driggs	Director, Branch Agricultural College

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Ernest A. Jacobsen	Dean, School of Education
Lewis M. Turner	Dean, School of Forest, Range and Wildlife Management
B. L. Richards	Dean, Graduate School
Carlton Culmsee	Dean, School of Arts and Sciences
Ethelyn O. Greaves	Dean, School of Home Economics
Jerald E. Christiansen	Dean, School of Engineering and Technology
Milton R. Merrill	Dean, Summer Quarter
Daryl Chase	Dean of Students
Ione S. Bennion	Dean of Women
King Hendricks	Director of Libraries
Russell E. Berntson	Executive Secretary and Treasurer
Eric A. Johnson	Purchasing Agent and Manager of Bookstore
Ralph Richards	Registrar
E. W. Timberlake, Colonel	Commandant, R.O.T.C.
C. Lester Pocock	Chairman, Public Relations
Vera Carlson	Secretary to the President
Sylvan Erickson	Assistant Secretary and Treasurer
Harold M. Wadsworth	Superindent of Buildings and Grounds

The Deans' Council consists of the President, all Deans, the Registrar, the Executive Secretary and Treasurer, and the Directors of the Agricultural Experiment Station and the Extension Service.

Faculty Committees

The President of the College is ex officio a member of each standing committee.

Assemblies—The President, Dean of Students, Professors Fogelberg, N. W. Christiansen, Myers, Student Representatives.

Athletic Council—Professors Hendricks, Alder, Caine, H. B. Hunsaker, Payne, Mr. Berntson, Romney, J. E. Christiansen, Stoddart.

Attendance and Scholarship—Professors V. H. Tingey, A. J. Morris, Ricks, Clara West.

Awards and Honors—Professors Ricks, Geddes, Milligan, W. P. Thomas, Blanch, Kelker, B. Johnson.

Credits and Admissions—Professors H. B. Peterson, Boyle, Hayward, Wilcox, Neuberger, Jones, Murray, Registrar.

Debating—Professors Robinson, Vickers, Murray, Hayward.

Graduate Council—Deans B. L. Richards, Culmsee, E. O. Greaves, Professors Carlisle, Williams, Hendricks, Thorne, Roskelley.

Graduation—Professors Symons, Jeppsen, R. Richards, L. E. Harris, Stone, Vermillion, Meyer.

High School Relations—Mr. Pocock, Professors Jacobsen, Cawley, Wrigley, Vickers.

Housing—Mr. Pocock, Van Shaar, Dean of Women.

Library—Academic Deans, Director Owens, Director of Libraries.

Loan Fund—Mr. Berntson.

Lyceum—Professors Fogelberg, N. W. Christiansen, Mr. Berntson.

Personnel and Guidance—Dean of Students, Dean of Women, Registrar, Professors Maeser, Stone, Jeppson, D. W. Thorne, Humpherys, Burns.

Pre-Medical and Pre-Dental Work—Professors Hammond, Culmsee, Scholes.

Professional Relations and Faculty Welfare Committee—D. A. Broadbent, L. L. Madsen, Murray, D. W. Thorne, Chase, Floyd, Frischknecht, E. O. Greaves, Symons, W. P. Thomas, Vickers, Williams. (For explanation of functions of committee, see p. 43.)

Publications Council—Professors Culmsee, Vickers, Turner, Reynolds.

Registration—The Academic Deans, Professors Hayward, Jeppsen, H. B. Hunsaker.

Schedule—Professors Calvert, W. W. Smith, Daines, Registrar.

Social Affairs Committee—Dean of Students, Dean of Women, Professors V. D. Gardner, Heaton, Miss Carlson.

Student Organizations—Dean of Students, Dean of Women, Professors Holmgren, Bee, S. Erickson.

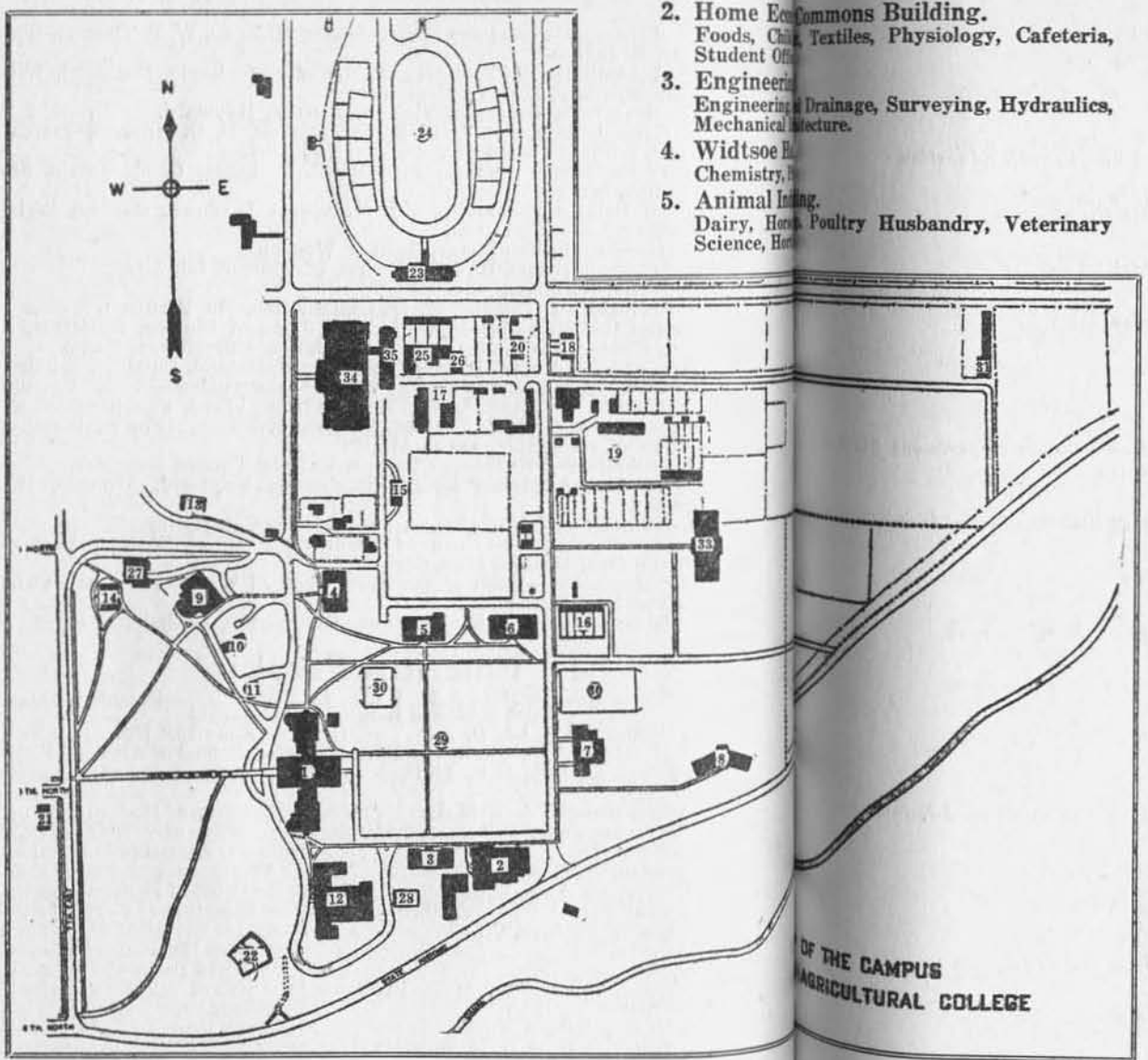
Teacher Placement—Professors Jacobsen, Humpherys, Carlisle, Cawley.

Emeritus Faculty

(Listed in order of seniority of appointment.)

Peterson, Elmer George, B.S., A.M., Ph.D., LL.D. . . . . President Emeritus
Peterson, William, B.S., LL. D. . . . . . Director Emeritus, Extension Service
Pedersen, N. Alvin, A.B., Ph.D. . . . . Dean Emeritus, School of Arts and Sciences
Greaves, Joseph E., B.S., M.S., Ph.D. . . . . Professor Emeritus of Bacteriology and Biochemistry
Arnold, Frank Russell, A.B., M.A. . . . . Professor Emeritus of Modern Languages
Frederick, Hyrum John, D.V.M. . . . . Professor Emeritus of Veterinary Science
Newey, Aaron, B.S. . . . . Professor Emeritus of Metal Work
Kyle, Charlotte, A.B., A.M. . . . . Professor Emeritus of English
Jensen, George C., A.B., M.A. . . . . Professor Emeritus of Modern Languages
Daines, Franklin D., A.B., M.A., Ph.D. . . . Professor Emeritus of Political Science
Peterson, Parley E., A.B., C.P.A. . . . . Professor Emeritus of Accounting
Swenson, D. A., B.S. . . . . Professor Emeritus of Woodwork and Building Construction
Moen, Johanna, B.S. . . . . Professor Emeritus of Textiles and Clothing
Dancy, Charlotte E., R.N. . . . . Professor Emeritus of Physiology
Peterson, Henry, A.B., A.M., ... Professor Emeritus of Psychology
McClellan, Charles E., A.B. M.A. . . . . Professor Emeritus of Education
Brown, Almeda P., B.S., M.A. . . . . Professor Emeritus of Home Economics
Sorensen, Alma Nicholas, A.B., A.M. . . . . Professor Emeritus of English
Evans, R. J., B.S., Ph.D. . . . . Professor Emeritus of Agronomy
Fletcher, Calvin . . . . . Professor Emeritus of Art
Barrows, Effie . . . Professor Emeritus, Extension Home Furnishings Specialist

LOCATION OF BUILDI RTMENTS AND OFFICES



1. Main Buil
   Offices of , Secretary-Treasurer, Registrar, Veterans' C Counselors, Chairman of Public Relations, Auditorium, Experiment Station, Agriculture ion, Dean of Students, Dean of Women, A Sciences, Education, Commerce, Bookstore.
2. Home Ec Commons Building.
   Foods, Chi , Textiles, Physiology, Cafeteria, Student Off
3. Engineeri
   Engineering Drainage, Surveying, Hydraulics, Mechanical itecture.
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   Chemistry,
5. Animal I ng.
   Dairy, Hors , Poultry Husbandry, Veterinary Science, Hor
6. Plant Industry Building.
   Botany, Agronomy and Soils, Bacteriology, and Public Health.
7. Library.
   English, History.
8. Women's Residence Hall.
9. Smart Gymnasium.
   Physical Education for Men and Women.
10. President's Home.
11. Extension Service Offices.
12. Mechanic Arts Building.
    Woodwork, Aviation, Radio, Machine Work, Farm Machinery.
13. L. D. S. Institute.
14. Forestry Building.
    Forest, Range and Wildlife Management.
15. Stock Judging Pavilion.
16. Green Houses.
    College and Experimental.
17. Dairy Barn.
18. Veterinary Science Laboratory.
19. Poultry Buildings.
20. Horse Barn.
21. Home Economics Practice Cottage.
22. Amphitheater.
23. Stadium House.
24. Stadium.
25. Hog Barn.
26. Sheep Barn.
27. Heating Plant.
28. Testing Laboratory.
29. Quadrangle.
30. Tennis Courts.
31. U. S. F. S. Equipment Shed.
32. U. S. A. C. Forest Nursery.
33. Rural Arts Building.
34. Field House.
35. Military Science Building.

Faculty

(Including College, Agricultural Experiment Station, Extension Service, and Branch Agricultural College)

Harris, Franklin S., B.S., Ph.D., LL.D.,
President

Alder, Byron, B.S.,
Professor of Poultry Husbandry

Allen, Bert V.,
Instructor in Photography
Photographic Service

Amacher, Winnifred, B.S., M.S.,
Instructor in Child Development and Parent Education

Andersen, E. Milton, B.S., M.S., Ph.D.,
Associate Professor of Vegetable Crops

Andersen, Stanley, B.S.,
Instructor in English and Journalism

Arrington, L. J., B.A.,
Assistant Professor of Economics

Ashton, Clarence D., B.S.,
Assistant Professor
Extension Horticulturist

Bailey, Reed W., B.S., M.S.,
Director, Intermountain Forest and Range Experiment Station
Non-resident Professor of Forestry

Bate, Russell, A.B., M.B.A.,
Assistant Professor of Accounting and Business Administration

Bates, George S., B.S., M.A.,
Collaborator in Teacher Training

Bee, Lawrence S., Ph.D.,
Associate Professor of Sociology

Beecher, Asa L.,
Assistant in On-the-Job Training

Bell, Marvin T., B.S.,
Instructor in Physical Education
Assistant Coach

Bell, William H., B.S., M.S.,
Associate Professor of Accounting and Business Administration

Bennion, Ione S., B.A.,
Dean of Women
Associate Professor
Supervisor, Women's Residence Halls

Bennett, James A., B.S., M.S.,
Assistant Professor of Animal Husbandry

Bennett, William H., B.S.,
Assistant Professor of Agronomy

Berntson, Russell E.,
Executive Secretary and Treasurer

Biddulph, Clyde, M.S., M.Ph., Ph.D.,
Associate Professor of Physiology

Binns, Wayne, B.S., D.V.M.,
Associate Professor of Veterinary Science

Bishop, A. Alvin, B.S., M.S.,
Assistant Professor of Irrigation and Drainage

Blanch, George T., B.S., M.S., Ph.D.,
Professor of Agricultural Economics and Marketing

Blaser, Glenn F., B.S.,
Veterans' Coordinator

Bowen, Calvin M., B.S., M. S.,
Associate Professor of Forestry

Bowen, Edith, B.S., M.S.,
Assistant Professor of Education

Boyle, William S., B.A., Ph.D.,
Assistant Professor of Botany

***Bracken, Aaron F.,** B.S., M.S.,
Professor of Agronomy

Bradford, James C., Lt. Col., QMC,
Assistant Professor of Military Science and Tactics

Bradley, Iver E., B.S., M.S.,
Instructor in Mathematics

Brimmer, Marvin L., 1st Sgt., DEML,
Instructor in Military Science and Tactics

Brite, J. Duncan, B.A., A.M., Ph.D.,
Professor of History

***Broadbent, Dee A.,** B.S., M.S.,
Associate Professor of Agricultural Economics and Marketing

Bullen, Asa, B.S., LL.B.,
Lecturer in Commercial Law

Burns, Ann, R. N.,
College Nurse

Burton, Theodore M., A.B., M.A.,
Assistant Professor of Chemistry

Caine, George B., B.S., M.A.,
Professor of Dairy Industry
Extension Dairyman

Calvert, Ralph L., B.A., M.A.,
Assistant Professor of Mathematics

Cannon, Melvin C., B.S., M.S., Ph.D.,
Associate Professor of Chemistry

Cannon, Norman, B.S., M.S.,
Assistant Professor of Accounting and Business Administration

Carlisle, John C., B.S., M.S., Ed.D.,
Professor of Education

Carlson, Oretta M., B.S.,
Instructor in Home Economics

Carlson, Vera,
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*On leave.

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Assistant Professor of Home Economics Education

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Dean of Students
Director, Student Personnel

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Assistant Librarian

Christiansen, Jerald E., B.S., M.S., C.E.,
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Director, Engineering Experiment Station

Christiansen, N. Woodruff, B.S., M.A., Ph.D.,
Professor of Instrumental Music

*Coe, Francis M., B.S., M.S.,
Associate Professor of Horticulture

Cole, Larry S., B.S., M.S.,
Associate Professor of Radio and Physics

Cook, C. Wayne, B.S., M.S.,
Assistant Professor of Range Management

Cotter, Harold E., Lt. Col., AC,
Assistant Professor of Military Science and Tactics

Coulam, Joseph, B.S.,
Associate Professor of Woodwork and Building Construction

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Professor and Director, Statistical Laboratory

Culmsee, Carlton, B.S., M.A., Ph.D.,
Professor of Journalism
Dean, School of Arts and Sciences

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Professor of Forestry

Davis, Anna Theurer, B.S.,
Instructor in English

Divine, Emmett,
Mechanic

Doty, Ina, B.S., M.S.,
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Instructor in Mathematics

*On leave

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Frederickson, Carmen, B.S., M.S.,
Instructor in Sociology

Frischknecht, Carl, B.S., M.S., Ph.D.,
Professor of Poultry Husbandry

Gardner, V. D., B.S., M.B.A.,
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Gardner, Willard, B.S., M.S., Ph.D.,
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Geddes, Joseph A., A.B., A.M., Ph.D.,
Professor of Sociology
Director, Division of Social Work

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Gilmore, Florence L., B.S., M.S.,
Instructor in Textiles and Clothing

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Assistant Professor of Modern Languages

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Dean, School of Home Economics

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Hardman, Stuart, B.S.,
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Hatch, LaPreal S.,
Assistant Librarian

Hayward, Ira N., B.S., Ph.M.,
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Hill, Reuben L., B.S., Ph.D.,
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Instructor in Military Science and Tactics

Holland, John L., M/Sgt., DEML,
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Holmgren, Arthur H., B.S., M.S.,
Assistant Professor of Botany
Curator, Intermountain Herbarium

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Hunsaker, H. B., B.S., M.S.,
Professor of Physical Education

Hunsaker, Neville C., B.A., M.A.,
Assistant Professor of Mathematics

Hurst, Clyde,
Instructor of Diesel Mechanics

Israelsen, Orson W., B.S., M.S., Ph.D.,
Professor of Irrigation and Drainage

Jacobsen, Eldon, B.S., M.S.,
Vocational Adviser

Jacobsen, Ernest A., A.B., M.A., Ed.D.,
Professor of Education
Dean, School of Education

Jennings, David S., B.S., Ph.D.,
Professor of Soils

Jensen, J. O., B.S.,
Instructor in Physics

Jeppsen, Ernest C., B.S., M.S.,
Professor of Industrial Education
Chairman, Division of Technology

Jessop, Howard V., B.S.,
Instructor in Sociology
Supervisor of Field Work in Social Work

Johner, Val M., Tec. 3, DEML,
Instructor in Military Science and Tactics

Johnson, Bertha F., B.S., M.A.,
Professor of Textiles and Clothing

Johnson, Eric A., B.S.,
Purchasing Agent and Manager of Bookstore

Jones, Lewis W., B.S., M.S.,
Assistant Professor of Bacteriology

Jones, Norman F., M/Sgt., DEML,
Instructor in Military Science and Tactics

Jones, William L., B.S.E.E.,
Instructor in Radio

Kelker, George Hills, A.B., B.S.F., M.S.F., D.Sc.,
Associate Professor of Wildlife Management

Kepner, Harold R., A.B., S.B., S.M.,
Professor of Civil Engineering

Kemp, Anton B.,
Instructor in Welding

Klein, Louis, Jr.,
Instructor in Aeronautics

Knowlton, George F., B.S., M.S., Ph.D.,
Professor of Entomology
Extension Entomologist

*__Larsen, Jessie,__ B.S.,
Assistant Professor of Art

Laser, Maxine, B.S.,
Instructor in Bacteriology

Lepley, Charles J., S/Sgt., DEML,
Instructor in Military Science and Tactics

Lindholm, Betty Lou, B.S.,
Instructor in English

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BRANCH AGRICULTURAL COLLEGE

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Director, Branch Agricultural College
Professor of English and Education

Cooley, Hazen, B.S., M.B.A.,
Assistant Secretary and Treasurer

Oldroyd, Elva, B.S.,
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Faculty

Ashcroft, Theron, B.S.,
Associate Professor of Physics and Engineering
Chairman, Division of Engineering and Mathematics

Bastow, Mary Lovina, B.S.,
Assistant Professor of Arts and Textiles

Bell, T. Donald, B.S., M.S., Ph.D.,
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Chairman, Division of Agriculture

Cooley, Charles B., B.S., M.Ed.,
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Chairman, Division of Industrial and Vocational Education

Cooley, Hazen, B.S., M.A.,
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Dalley, Parley, B.S., M.S.,
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Chairman, Division of Physical Sciences

Hardy, Eugene,
Assistant Professor of Auto Mechanics

Halvorsen, Roy L., B.S.,
Associate Professor of Music

Le Baron, George L., B.S.,
Instructor in Physics and Radio

Lindquist, Ray, B.S.,
Director of Physical Education

Manning, Wm. H., A.B.,
Associate Professor of Voice and Theory

Maughan, Murry, B.S.,
Instructor in Physical Education
Athletic Coach

Nelson, Donald K., B.S., B.L.S.,
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Olsen, Floris S., B.S.,
Instructor in Secretarial Science

Parks, Hazel, B.S.,
Instructor in Foods

Peterson, Edwin L., B.S., M.A.,
Assistant Professor of Social Science

Plummer, H. J., B.A., M.A.,
Assistant Professor of English
Veterans' Coordinator
Dean of Students

Sargent, David L., B.S., M.S.,
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Chairman, Division of Biological Sciences

Schmutz, Clarence, B.A., M.A.,
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Stephensen, A. W., B.S.,
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Chairman, Division of Commerce

Swindle, Karma P., B.S.,
Dean of Women
Assistant Professor of Home Economics

Tippetts, Twain, B.A., M.A.,
Assistant Professor of English

Whetten, Lois LaVeve, B.S.,
Assistant Professor of Physical Education and Secretarial Science

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Assistant Professor of Range Management

Instructor in Agriculture and Biology

Instructor in Mathematics

Instructor in Education and Psychology

Instructor in English

INTRODUCTION

General Information

LOCATION

UTAH State Agricultural College is in Logan, Cache County. The city is a typical college town of 12,000 inhabitants. Highways 89 and 91 intersect at Logan, and the town is served by the Utah-Idaho Central bus line, the Fastway bus line, the Greyhound bus line, and the Union Pacific Railroad. The College is located one mile east of the business section of Logan on a hill overlooking the valley.

POLICY

Utah State Agricultural College in its fundamental policy has always considered the main function of education to be the preservation and improvement of the democratic way of life.

Although the College remains alert to satisfy emergency needs of state and nation, it continues a full educational offering in the seven schools of instruction. To do less than this would be to weaken the very foundations upon which democracy rests, for now more than ever before the country needs men and women trained for efficient leadership in every branch of human endeavor. Accordingly, the traditional policy of the College will be maintained, which, in accordance with the spirit of the law under which it was organized, is to provide a liberal, thorough, and practical education. The two extremes in education, empiricism and the purely theoretical, are avoided; for the practical is based upon and united with the thoroughly scientific. In addition to the practical work of the different courses, students are given excellent training in the sciences, mathematics, history, English, art, music, speech, modern languages, and other related subjects. The object is to foster all that makes for right living, good citizenship, high efficiency, and general culture.

Under this general policy, the special purpose of Utah State Agricultural College is to be of service in the building of the State and the great West to which it belongs. The instruction in Agriculture, Engineering, Forest, Range, and Wildlife Management, in addition to the purely professional aspects of these fields of study, deals with the special problems relating to the conquest of the great areas of unoccupied lands, the development of engineering structures, the proper use of the water supply, and the kinds of crops or livestock which in Utah and the West may be most profitable. Instruction in mechanic arts points out the most promising trades and teaches them in such a way as to meet the needs of the area. Instruction in Commerce relates to the undeveloped resources and the present commercial conditions of the State, and investigates the principles and methods to be applied in the commercial growth of Utah. The School of Home Economics offers training in the various phases of homemaking and for professional life. In the School of Education students are given the professional training which qualifies them for teaching and school administrative positions.

The Constitution of Utah establishes Utah State Agricultural College and the University of Utah as the two State institutions of higher learning. Each of these institutions is independent in government, although each is a part of the public school system. Each, under the Constitution and the Statutes of Utah and in harmony with the ruling of its governing board, offers undergraduate and graduate work leading to the Bachelor's and Master's degrees. The College, in addition to this high status given it in Utah under the Constitution, is one of the fifty-one Land-Grant institutions in the United States designated by the Federal Government as the institutions of higher learning in the respective states for the development of the Federal program of education included in the Morrill and Nelson Acts of the Federal Congress.

HISTORY

Utah State Agricultural College, the Experiment Station and the Extension Service exist today because of far-sighted legislation which created, stated the purposes, and set forth the fields of activity of these divisions. The Morrill Act of 1862 provided for the establishment of Land-Grant Colleges by the grant of Federal lands thus providing a material basis for these institutions. Utah received 200,000 acres. The second Morrill Act of 1890 carried an annual appropriation to each college; the sum to be spent for instruction in designated fields. Additional Federal legislation increased the financial aid to the institution, including the Hatch Act of 1887 for experimental purposes, the Smith-Lever Act of 1914 to aid in beginning and developing extension work, and more recently, the Bankhead-Jones Act which supports all three divisions in some degree. All these acts constituted the basis of Federal participation in the extension of college education and rural agricultural development to the masses of American people. It was a democratic movement in education. Participation by the Territory of Utah in the Federal program of education came through the passage of an act "to establish an Agricultural College and an Agricultural Experiment Station." This bill, introduced into the legislature by Representative Anthon H. Lund on February 27, 1888, unanimously passed both houses and was signed by Governor Caleb West, March 8, 1888.

The purposes of the college have been stated in Federal and Territorial acts. The Federal Land Grant Act of 1862 explained that the colleges were, "without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." The Territorial Act of 1888 confirmed these purposes and defined the fields of instruction offered by the college to include "the English language and literature, mathematics, civil engineering, agricultural chemistry, animal and vegetable anatomy, physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed, technology, political, rural and household economy, horticulture, moral philosophy, history, bookkeeping, and especially the application of science and mechanical arts to the practical agriculture in the field." Though the fields of education increased in number and scope and additional subjects were added to the curriculum in harmony with subsequent legislative acts, each president of the college has reaffirmed the purposes as set forth by the Federal and Territorial founders of the school.

The necessary legislation having been enacted to set up the machinery, the next important task was to establish the college concretely. The Lund Act declared the school should be erected "at any place in Cache county that may be designated by the trustees." Logan and Cache county gave the present site of one hundred acres and in 1889, the contract for the south wing of the main building was let to the contractors. Professor J. W. Sanborn of New Hampshire was chosen as director of the Experiment Station, and in 1890, he came to Utah, arriving in Logan in January. The wing of the building was completed, members were chosen for the experiment station and the college staff, and in September 1890, the college opened its doors to prospective students. President Sanborn, Professors W. P. Cutter, E. S. Richman, John T. Caine, Jr., Abby Marlatt, A. A. Mills, Jacob Sholl, H. C. Everett, and Sarah Goodwin formed the first faculty. The student body of 1890-1891 totaled 139, many of them being below the college rank of those days.

Since its beginning in 1890, seven presidents have guided the destinies of the college. Following President Sanborn came President J. H. Paul in 1894, President J. M. Tanner in 1896, President W. J. Kerr in 1900, President John A. Widtsoe in 1907, and President E. G. Peterson in 1916. Dr. Franklin S. Harris, in taking over in 1945, became the seventh president of the institution. From one building in 1890, the number of buildings has reached thirty-seven, the college faculty has grown from 9 in 1890 to 283 in 1947, and the student body has expanded from 139 in the beginning to a cumulative total of the regular school year of 4500 regularly enrolled students in 1946-47. In addition, there were several hundred students in "related instruction" courses.

Seven schools: Agriculture, Arts and Sciences, Commerce, Education, Engineering Technology, Forest, Range and Wildlife Management, and Home

Economics, provide professional and cultural training. The institution is on the accepted list of the Association of American Universities and the American Association of University Women. In 1929 the name of the college was changed from Utah Agricultural College to Utah State Agricultural College.

PHYSICAL PLANT

The physical plant of the College has been built over a period of half a century, and comprises one of the most beautiful college campuses in the whole country. It occupies more than ninety acres of the large delta built up of gravels and sediments brought down from the Wasatch Mountains to the east by Logan River into ancient Lake Bonneville over thousands of years. Many of the structures and landscape features of the campus still suggest something of the doings of nature in that remote past. Alterations and carvings of the old lake delta into beautiful terraces, curves and elevations, during the times of its ups and downs and since the last recession of the ancient lake to its present Salt Lake remnant, are still outstanding features. Viewed from the College Hill in any direction, north, south, east or west, the mountains, the valley, the green fields, meandering streams, and the distant horizons with their angular profiles against clear blue skies, all furnish real sources of inspiration and admiration.

Buildings and Facilities

To house its many varied and rapidly growing educational and research activities, the College now has thirty-seven carefully planned, mostly modern, steam heated and well lighted buildings on the campus. Identified with each building or group of buildings are to be found centers of student activities and interests which largely go to make up the undergraduate life at the college.

The Main Building, so called, a three-story brick structure more than three hundred and fifty feet long, is the landmark in the history of the institution. This building, whose halls and classrooms have resounded to the voices of the classes coming and going since the college was founded more than fifty years ago, is the hub about which most of the college activities revolve. In it are located the administrative and the business offices of the College and Experiment Station, the departments of Agricultural Economics, Art, Education, Geology, Landscape Architecture, Mathematics, Modern Languages, Music, Psychology, Sociology, Speech, Zoology, and the School of Commerce. The College bookstore is in the basement. The main auditorium of the College, meeting place for most student gatherings, is also located in the east wing of the building. A Little Theatre, used by the Speech department, is on the second floor, west wing. The offices of the Dean of Students, Dean of Women, and the officials who supervise the war veterans enrolled at the College are on the first floor, north wing.

A new combination Home Economics and Commons Building, perhaps the most imposing and carefully planned building on the campus for its multiple purposes, is now the social and cultural center of the College. Architecturally, the building is beautiful and modern in every respect. It is used exclusively for college functions, the students and faculty alike taking advantage of the facilities offered in the way of lounges, reception and ball rooms. The building also houses a beautiful cafeteria with well equipped kitchens and dining rooms which add greatly to the comfort and convenience of the student and faculty patrons. Educationally, this new structure functions on the campus as the housing quarters of the School of Home Economics and classes in Physiology. These several departments are provided with ample space in modern, well-lighted classrooms and laboratories. All research and practice laboratories are provided with standard, scientific equipment. Student Body offices are also located in this building.

The Thomas Smart Gymnasium, a brick structure erected in 1912, is still the center of a large part of the athletic activity on the campus. Since its erection, this building up to a few years ago, housed the department of Physical Education for men and women, competitive Athletics, indoor and intramural sports, and the offices of the college physician and school nurse, and the whole of the physical education staff. With the completion of the new stadium and

athletic field houses, the crowded condition in the Smart Gymnasium has been greatly relieved. The whole of the Department of Competitive Athletics has been relocated with adequate quarters in the new buildings. These changes have brought about a much more satisfactory housing arrangement together with an adequate and efficient physical training plant.

The new Field House, a spacious steel and brick structure, 356 feet long, by 137 feet wide, completed in 1939, has already become a much used building for functional activities of the College. Besides being the new center of college competitive athletics, the building is coming more and more to be used for other large college and public gatherings. Especially, since the size of the student body became a problem, has the new Field House demonstrated its multiple purpose usefulness by providing adequate space for the annual commencement exercises. Equipped with an excellent basketball playing floor and a seating capacity of more than three thousand, the building now provides ample space to accommodate both students and the public at basketball games or other athletic contests. For indoor tennis, track, softball and football practice, the building is ideal.

A companion building to the Field House, completed in 1940, is the Military Science Building, located just a few feet to the east with a corridor connection between the two. This brick-concrete structure, is 59 feet wide by 180 feet long. It was designed for the special needs of the Military Science and Tactics department and is provided with excellent offices, classrooms, rifle ranges, gun and equipment supply rooms. A large gun shed is made a part of the building. Because of its location with relation to the Field House, military training the year 'round has been greatly facilitated.

The Extension Service Building, one of the old buildings on the campus, is a two-story brick structure. It was originally occupied by the Experiment Station Staff. Since the College Extension Service became an important function of the institution, this building has been occupied by the Extension Eervice Staff, and is now the headquarters of a state-wide educational service organization, maintained by the College and Federal Government jointly.

Widtsoe Hall, a three-story, brick-concrete, fireproof building, was constructed in 1915. It is wholly occupied by the departments of Chemistry, Physics, and the Experiment Station Laboratories. All classrooms in the building are well lighted and heated, and provided with desks and equipment for teaching demonstrations and experiments. Chemical and Physical laboratories are furnished with ample facilities and scientific equipment for student training and research in these fields.

The Animal Industry Building, a three-story, brick-concrete structure erected in 1917, is occupied by the departments of Dairy Industry, Animal Husbandry, Poultry, Vegetable Crops, and Horticulture. In its large and well-lighted rooms, the building is exceptionally well equipped with laboratory and classroom facilities for the study and teaching of dairy manufacturing and animal husbandry, including dairy and beef cattle, horses, hogs, sheep and poultry. A modern and fully equipped cheese and butter manufacturing plant occupies part of the building, which is used for practical training in dairy products manufacturing. Complete laboratories for research and studies in animal nutrition and wool grading are new additions in this building. Classrooms and office space for the departments of Vegetable Crops and Horticulture are provided in this building until such time as other and more suitable quarters can be provided for the work in these fields.

The Plant Industry Building is also a brick-concrete structure of four stories, erected in 1917. It is modern in design and arrangement, and houses the departments of Agronomy, Bacteriology and Public Health, Botany and Plant Pathology. Housed in this building, also, is the large Intermountain Herbarium, located in new quarters on the fourth floor. All the departments in this building are provided with well-lighted classrooms and laboratories.

The Engineering Building, a modern, four-story, brick-concrete, fireproof structure, also erected in 1917, was well planned for its special purpose—training in engineering work. The School of Engineering and Technology has its headquarters here. In this building, all the college work in Civil Enginering, including Surveying, Mechanical Drawing, Hydraulics, Irrigation and Drainage, Municipal and Agricultural Engineering, is taught. This building houses the Hydraulics, Irrigation, Soil Mechanics, and Agricultural Engineering Labora-

tories, all of which are modern and well-equipped. The Drafting rooms and the Design Laboratories are also housed in this building.

The Mechanic Arts Building, housing the shops of the School of Engineering and Technology, located to the south of the Main Building, is another of the older buildings of the College. To keep pace with the rapidly expanding demands for training in automotive, radio and areonautical mechanics, the building has been extensively remodeled and additional floor space provided. It now houses all shops and laboratories on the campus used for the work in the technology of Air Conditioning, Auto Mechanics, Forging, Industrial Education, Radio and Machine Practice, Electronics, Sheet Metal, Welding, Woodwork and Building Construction. Laboratories, classrooms, shops, radio and sound recording rooms used in these several fields, are adequately equipped to give complete training to students wanting to prepare themselves for the skilled technical trades and for service as technicians in industry. Much new equipment has been added to the shops during the past five years.

The Library Building constructed in 1930, academic and cultural center of the College, is located on the east side of the campus. Space is also provided in the building for a Children's Library in connection with a beautifully designed special reading room for under-college-age groups. The departments of English and History use the top floor for their classes because of the convenient access to the library stacks.

The Forestry Building, located on the northwest corner of the campus, is another of the older buildings of the College. A four-story, brick structure, in the olden days it was originally a girls' dormitory, and later, the home of the School of Home Economics. Rearranged when the new Commons and Home Economics Building was completed, it now houses the School of Forestry. In this comparatively new educational field, thorough and technical training in the departments of Forest, Range and Wildlife Management is provided by the College. Its classrooms, laboratories and specimen museums are provided with equipment and all facilities for complete training in these new and important fields of national resources. In connection with the Forestry School, the College conducts a Forestry Summer School for students at its own camp, located in Logan Canyon about 20 miles northeast from the College.

Child Development laboratories and practice houses occupy two campus residences immediately north of Widtsoe Hall. In connection with these, outdoor space, well supplied with playground equipment, is available to the important and rapidly growing Child Development movements.

The Campus Residence Hall, a fireproof, air-conditioned building located south and east of the Library, provides modern accommodations for 100 freshman women. Life in the Hall generally is both comfortable and pleasant. Bed linen is provided and laundered by the College.

The Town Residence, converted from a large former Logan residence, houses 46 upper-class women. Life in this hall is pleasantly home-like. Bed linen is also provided and laundered by the College.

Anticipating a permanent Union Building, students began in 1946 to enjoy the recreational facilities of a temporary Union Building east of the Library. A structure formerly used for military training was converted for this use.

College greenhouses on the campus are now composed of seven complete units which cover 11,588 square feet of planting space. Head houses, built in connection with the greenhouses, furnish room for laboratory, storage, and sorting space needed for student training and research in plant breeding and propagation in horticulture, floriculture, vegetables, grains and grasses. In 1939, two new greenhouses were added to the plant, which have greatly relieved the crowded condition in the old houses. The new houses are used largely for experimental work in plant breeding research, insect and disease control.

The College barns include a group of buildings suitable for the care of cattle, horses, sheep and hogs with ample storage space for supplies of livestock feeds. In the college owned herds on the campus, are to be found individuals and groups representative of various breeds of livestock common to the intermountain section. An experimental demonstration Holstein dairy herd is maintained and operated by the College and Experimental Station on a modern dairy farm located at North Logan, one mile north of the campus. In 1939, more pure bred dairy and beef cattle were added to the herds. Most of these

additions are located on farm property recently acquired from Cache County, both of which add greatly to the facilities of the College for training students in livestock feeding and breeding technique.

A Stock Judging Pavilion on the campus, used in common by the several livestock departments, makes it possible to do stock judging under comfortable conditions at all seasons of the year.

The Poultry Plant, built on the colony plan, is equipped for class and experimental research work in poultry husbandry. Among the College flocks are all the important breeds of domestic fowls. The plant is equipped and extensively used for study and research on the best methods of feeding, housing, and disease control in poultry to obtain the most economical production.

The Veterinary Science Building, a one-story brick-concrete structure, and a recent addition to the campus buildings, has office space, a well equipped dispensary, operating rooms, stalls for animals, and modern equipment for training and scientific work in the field of Veterinary Science and Medicine. A veterinary clinic is periodically conducted in connection with the work of this department. The building is equipped for research and clinical work in Veterinary Science and animal diseases.

The heating plant of the College is located in one central boiler house on the campus. From this central plant, heat is supplied to the buildings by means of steam through distribution lines in underground tunnels. To provide adequate heat for the greatly increased campus requirements of the last few years, the plant was much enlarged in 1939 and put on a high pressure steam operating basis. The plant now has a capacity of approximately 1000 horsepower. The latest addition to the plant was a 290 horsepower water tube boiler, capable of operating at 100 per cent overload.

Laboratories

The College laboratories, including Animal Breeding, Animal Nutrition, Bacteriology, Botany, Chemistry, Engineering and Technology, Entomology, Farm Crops, Geology, Home Economics, Mineralogy, Physics, Physiology, Plant Pathology, Soil Physics, Wool and Zoology, are adequately equipped and provided with satisfactory working conditions. The equipment of the laboratories is generally complete and extensive experimental research work is carried on by the faculty and advanced students in many scientific fields.

College Library

The College Library is designed primarily to provide students with the books, magazines, and documents they need in their resident study programs. Its next purpose is to provide faculty members with the volumes they need to prepare themselves for their teaching and research functions. However, any citizen of the State may make arrangements to borrow through his home library any book not in actual use or demand. Citizens located near enough to the College to do so, may call and make arrangements to use the library directly.

The Library is currently undergoing an extensive program of reorganization and expansion to meet the needs of an Institution that is growing in size and complexity. Besides the addition of many thousands of books and other publications, the Library is being improved in arrangement and cataloging.

The collection, which now numbers approximately 115,000 volumes, plus 150,000 government documents, is housed in a building erected in 1930. On the first floor are located the Reserve Book Room, cloakrooms, and the Children's Library, on the second floor the Loan Desk, Reference Desk, and catalogs, indexes, and the main reading room. The third floor is used for classes of the departments of English and History.

The collection of government documents is especially strong as it is a depository library. Furthermore, the Experiment Station Library has been recently incorporated in the Main Library, practically doubling the holdings in the United States Department of Agriculture publications and various state agricultural experiment station bulletins.

The sets of periodical and serial publications, particularly those sponsored by learned societies, are being added to and missing volumes filled in each year. The College subscribes to 1150 scholarly journals and receives 136 as gifts. The College subscribes to all Utah newspapers and to outstanding papers of the United States and Canada.

Herbarium

The Intermountain Herbarium was established in 1932 by action of the Board of Trustees. The function is largely to serve as the repository of plant materials obtained by field exploration, gifts, and exchanges with other institutions; materials that constitute the basis upon which the rich native vegetation of Utah and the Intermountain Region is receiving scientific, economic, and popular investigation and descriptive treatment. From time to time the results of the herbarium researches are released as technical articles published in scientific journals or economic and popular bulletins and circulars released by the Utah Agricultural Experiment Station.

Most of the species that grow in Utah and the Intermountain Region are represented in the herbarium.

The herbarium is likewise the depository of a branch of the College Library, consisting of literature dealing with floristic botany and descriptive taxonomy.

Graduate work in plant taxonomy offered by the Department of Botany utilizes the adequate facilities of the herbarium. These graduate studies may entail thesis researches of a phytographic, revisionary, or floristic nature.

The facilities of the herbarium are also available, by arrangement with the curator, for consultation and research by all qualified members of the College Staff, students, collaborating agencies, institutions and members of the community.

Identification of and information concerning native or introduced plants will be provided by the herbarium staff. Requests for information or plant identification should be addressed to the Curator of the Herbarium.

STUDENT ORGANIZATIONS

Government and Traditions of the Student Body Organization

THE Student Body organization embraces all the students of the Institution. Its prime object is to foster a proper spirit of college loyalty, and to give the students practice in managing public affairs. It also secures dispatch and efficiency, as well as uniformity, in the administration of all matters pertaining to the entire student body, and encourages all students to participate in a limited number of college activities. A point system of awards to recognize participation in all non-athletic activities encourages high scholarship during participation by means of graduated bonuses for higher scholarship. The organization provides each member with a maximum of proper athletic, theatrical, and social recreation at a minimum of expense. This organization has control, with faculty cooperation, of the following student activities:

1. a. Athletics for men.
   b. Athletics for women.

An intramural program, including all seasonal sports for which awards are given, is conducted.

2. Musicals, including all public performances of the band, the orchestra, and musical clubs. These organizations present several concerts during the year and each group usually tours some part of the surrounding area.

3. Theatricals. There is great activity in the field of the drama, and numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting. The performances of recent years have been of high quality.

4. Opera. Each year the Music Department produces an opera. With successful performances of such works as Rigoletto, Faust, Aida, Il Trovatore, Carmen, Student Prince, and Blossom Time, the annual production of an opera or operetta has become traditional.

5. Debating and Public Speaking. Debating is an extremely popular activity, drawing approximately 30 participants each year. The College is a member of the Rocky Mountain Forensic League and each fall meets schools of this group in debate, oratory, extemporaneous speaking, after dinner speaking, and panel discussion. Participation in the Utah-Idaho Junior College Forensic League and in debate tournaments on the Pacific Coast provides ample opportunity for experience in tournament debating. Intrastate debates are held in the form of a state legislature and are highly successful.

6. Student Publications. The students of the College publish a weekly school paper, "Student Life," the College yearbook, "The Buzzer," and a quarterly magazine, "Scribble," all of which are distributed to all of the regularly registered students. Some campus organizations also sponsor publications of their own such as the Forestry Club's "Juniper."

7. Lyceum Course. The Lyceum program which brings numerous national and international figures to the College is one of the most important Student Body activities.

8. Dances and Entertainments. At frequent regular intervals, the Student Body organization sponsors all-college dancing parties, informal and formal in nature, and regular student body assemblies which provide extensive expression for all student talent. Students with talent and interest in such participation should register with the Student Public Service Bureau.

Associated Women Students is an organization made up of all women students registered at the college. Its purpose is to unite the women of the college and encourage activity of women in campus affairs and development of talents.

Campus Organizations

Fraternities, Honorary, Alpha Epsilon Delta (pre-medical), Alpha Kappa Psi (commerce, men), Alpha Zeta (agriculture, scholastic), Blue Key (service), Delta Phi (mission service), Lambda Rho (journalistic, women), Xi Sigma Pi (forestry, scholastic), Phi Kappa Phi, (scholastic, co-educational), Phi Upsilon Omicron (home economics, scholastic), Pi Gamma Mu (social science), Scabbard and Blade (military, men), Sponsors(military, women), Theta Alpha Phi (dramatic, co-educational), Theta Chi (business, women), Fourth Estaters (journalistic, co-educational), Spurs (service, sophomore women).

Fraternities, Social. Beta Kappa, Lambda Chi, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon.

Sororities, Social. Alpha Chi Omega, Chi Omega, Kappa Delta, Theta Upsilon, Gamma Tau.

Clubs. Ag Club (agriculture), Ag Econ, Agora (debating), Independent Students' Association (unaffiliated students), Civil Engineers, Empyrean (literary), 4-H Club (social), Foresters, Home Economics Club (home economics majors), Inter-Collegiate Knights (service, men), International Relations Club (discussion group), Ladies' Glee Club, Men's Glee Club, Phrateres, Women's Athletic Association, Aggie Veterans Organization.

The offices of the Dean of Students and Dean of Women, in conjunction with other members of the Committee on Social Affairs, render specific aid to all organizations in their financial planning.

Assemblies

A general assembly is conducted each week in the main auditorium. A joint student-faculty committee plans the assemblies, which consist of lectures, debates, dramatic presentations, concerts, and other elements selected for the enlightenment, cultural development, and entertainment of the students.

The hour beginning at 11 a. m. Tuesdays has been set aside as the time for the general assemblies.

The hour beginning at 11 a. m. Thursday is used for special assemblies or meetings of groups. The faculty has voted to schedule no regular classes at 11 a. m. Thursday that would interfere with the mass review of the Military Science and Tactics Department, which is conducted at that hour.

ALUMNI ASSOCIATION

W. W. GARDNER, *President*
D. A. SKEEN, *Past President*

LEONARD W. MCDONALD, *Executive Secretary and Treasurer, Director, Division of College Development and Alumni Relations.*

The Utah State Agricultural College Alumni Association was organized on June 13 and 14, 1899, by a group of Alumni who met on the campus and formed the Association. At that time there were 44 members. The Association has shown consistent and rapid growth until it now numbers more than 7,200 graduates and approximately 40,000 former students who did not obtain degrees.

The graduates of Utah State Agricultural College have achieved outstanding prominence in every walk of life and every state in the nation. Aggie alumni in large numbers served in the late war, and an exceptionally large number of these men and women held or are holding high commissions in the military and naval forces.

Purpose. It is the purpose of the Association, (1) to form and strengthen friendships among the Alumni; (2) to foster feelings of gratitude and love for the College; (3) to establish beneficial relationships between the Alumni and the College; (4) to promote the interests and welfare of the College and its Alumni; (5) to represent the interests of the Alumni in the welfare, standards, and advancements of the College; and (6) to serve as a representative of graduating classes after they have left the Campus.

Membership. Any person who has attended the Utah State Agricultural College one quarter or more may obtain membership in the Alumni Association by making application to the Alumni Executive Committee. All persons receiving degrees, diplomas or terminal vocational certificates from the College automatically become members of the Association. Sustaining membership in the Association may be had by parents of graduates or students or by others who have shown an interest in the College or the Association, upon the payment of annual dues of five dollars. Persons not eligible for regular membership in the Association, but who have done some outstanding service to the Institution are eligible for honorary membership, and may become honorary members upon recommendation of the Executive Committee, and upon being accepted by the Alumni Council.

Dues. Annual dues are $2.00 per year and joint annual dues (husband and wife) are $2.50 per year. Life membership may be obtained singly at $25.00 or $35.00 for a joint membership.

Government. The governing power of the Association is vested in the Alumni Council composed of fifteen elected members, and ex officio members. From this group, a president and four executive members are chosen. The president and the executive committee select the Executive Secretary and Treasurer of the Association when that position is declared vacant. The Alumni Executive Secretary is the official representative of the Association on the College Campus. Senate Bill 90 which was passed by the 26th sesion of the legislature and signed by the Governor March 15, 1945, makes the president of the Alumni Association an ex-officio member of the Board of Trustees of the College.

Function. Besides maintaining a complete record of each alumnus after graduation, two special projects have been originated and sponsored by the Alumni Association—the Library Endowment Trust Fund and the Life Membership Fund. Earnings from the former fund, accumulated from popular subscriptions, are given to the College Library to aid it in the purchase of books which ordinarily could not be bought from the regular library budget.

The principal from the Life Membership Fund has in the past been loaned to worthy students to aid them in finishing their college work. Interest from the loans is used to support the Alumni Association.

The Association serves as a parent organization for several active chapters in Utah which each year sponsors dinner meetings and parties for alumni and former Aggie students in their respective areas.

Since September, 1925, the Alumni Association has published the Utah State Alumni Quarterly, a magazine appearing four times each year and devoted to keeping Alumni members informed of each other's doings, and to maintaining a strong relationship between the Alumni and College.

The Board of Trustees of the College have by formal action created the Division of "College Development and Alumni Relations" which the Alumni Secretary heads. It is anticipated that the establishment of this division of the College will open up avenues of service and support for the College by its Alumni members.

PROFESSIONAL RELATIONS AND FACULTY WELFARE COMMITTEE

The Professional Relations and Faculty Welfare committee has been authorized by the Board of Trustees and the Administration and elected by the Faculty to represent the faculty on matters pertaining to professional relationships and welfare. One of the principal duties of the Committee is to cooperate with the Administration in the development and the attainment of the adoption and the inauguration of standards, policies, and programs on Faculty professional relations and welfare, leading to better understanding and improving the relationships among the Faculty, the Administration, students and other groups.

ACADEMIC REGULATIONS

For purposes of administration, the College is divided into the following major divisions: (1) the Academic, which is administered through eight schools; (2) the Research, administered through two Experiment Stations; (3) the Extension Service; (4) the Summer Session; (5) the Correspondence and Extension Class Work; and (6) the Branch Agricultural College at Cedar City. The academic regulations apply to all instructional work of regular session, summer session, correspondence and extension study.

Admission

Prospective students are urged to send official transcripts of their credits to the Registrar at least two weeks before the opening of school.

ENTRANCE with college standing is based upon (a) graduation from an accredited high school or (b) upon presentation of fifteen approved high school units of work or (c) by examination of those students eighteen years of age or older who have had other training.

Students who have not been graduated from high school and who are presenting fifteen approved units for entrance may include one unit of credit for military science or one unit of physical education, but not more than one unit in combination.

Entrance by examination will be based upon two types of tests developed by the U. S. Armed Forces Institute or other comparable tests approved and recommended by the American Council on Education. **First,** the tests of general educational development which are designed to measure the extent to which all of the educational experiences of the applicant for admission have contributed to his ability to "carry on" in a program of general education, or to his educational development of the type which might otherwise have resulted from attendance in a regular academic high school. **Second,** Subject Examinations: Each of these subject examinations may be used to determine whether the achievement of the applicant for admission is the equivalent of that expected of regular high school students for satisfactory completion of a corresponding course of classroom instruction.

Students who do not otherwise meet the entrance requirements will be required to take the General Achievement Test at the time of entrance. A student who fails this test because of extenuating circumstances prevailing at the

moment may, upon the recommendation of the Examiner, be admitted on a conditional basis and permitted to take an alternative test sometime during the first quarter and, thereby, establish college standing as of the date of original entry.

No credits obtained prior to the time at which college standing was established can be used toward a degree, except that where the amount of high school deficiency is so small that it requires but part of the student's time to carry courses to remove high school deficiencies, the remainder of the student's time may be spent on college courses and the credit so earned may be accepted to satisfy degree requirements. Students under eighteen years of age may not enter with a high school deficiency.

The following suggestions are designed to emphasize the desirability of including various studies in the high school program of the student who plans to enter college.

1. **English.** Since the ability to write clearly and to read with understanding and appreciation is essential, it is highly desirable that the student complete three or four units in English.

2. **Mathematics.** Not only as a tool to further learning but as a means of providing basic education, mathematics has much to offer. Two years of such study would be profitable. Students planning to specialize in the sciences or in engineering should complete two or more units in mathematics in high school.

3. **Social Studies.** Social studies—such as history, civics, government, economics, sociology and geography—are basic to the understanding and solution of contemporary problems in the community, in the nation, and in the world. From two to four units may well be devoted to this area by the prospective college student.

4. **The Sciences.** This field is rich in possibilities for understanding the modern world. Two units in science might well be completed. For those who plan to emphasize science or engineering in college, three units would be helpful.

5. **Foreign Languages.** The prospective college student might well develop a basic reading or speaking knowledge of a modern foreign language. Some background in one of the classical languages would also be desirable.

6. **The Fine Arts.** This field offers opportunity for development in an important area of general education which can contribute much toward individual growth.

7. **Other Subjects.** None of the foregoing statements should be interpreted as meaning that other subjects—agriculture, commercial subjects, home economics, industrial arts, speech, etc.—should be avoided by the student who is planning to attend college. Such subjects, when properly studied, contribute materially to the educational growth of the individual and prepare him for continued study as well as for the more general activities of living.

Students who expect to become candidates for any degree or diploma from any of the schools of the College must include among the units presented those preparatory courses which are specified as prerequisite to the beginning college courses in the various fields. Such students are urged to give serious thought to the matter of selecting a major field of interest. Each student in cooperation with his parents, his high school principal or other high school adviser should plan the high school program of studies so as to meet the requirements for admission to his chosen field of interest. Students who fail to do this may expect to be delayed in starting their college work until the prerequisite courses are made up. Not all of the schools and departments of the college have specified prerequisites, but those who do have, list them in their school and departmental section in the college catalog. This information should be used in planning the high school course.

Transfers from Other Colleges. (Advanced Standing): The College does not grant collegiate credit for excess high school work. Advanced standing for work of satisfactory grade done in some other accredited college, after the completion of 15 units of high school work, may be granted by the Committee on Advanced Standing, provided the student presents satisfactory evidence that the work offered is equivalent to the work for which he wishes to substitute it. **Transcripts submitted for evaluation become the property of the Institution, and will not be returned. Advanced standing credits, while they may be ac-**

ceptable toward a degree, will not be included on a transcript of college credits until after the degree has been conferred. Transcripts should be sent to the Registrar two weeks in advance of registration. It is necessary to have them at the time of registration, in order to arrange the course of study properly.

Provisions for Education of Veterans. Utah State Agricultural College has a broad and diverse curriculum. This makes possible the training of ex-service men and women for many different occupations and at the same time provides ample opportunity for general education.

The College has also made special provision for entrance, vocational advisement and adjustment, acceleration, and curriculum adjustments for these men and women.

It is possible, on the basis of evidence of educational growth since leaving high school and by the demonstration of aptitude for college work on tests for this purpose, for students to enter the College without completing all high school requirements.

Acceleration toward the degree may be obtained by submitting records of formal and informal educational development somewhat equivalent to that which might have been expected from college study and by taking tests of such development. Credit will be given for training received in military service when such training meets the standards of the Institution and is equivalent to courses offered in the Institution. Review and short refresher courses will also be given when found needed.

Registration and Credits

Quarter Credits (Definition): A quarter hour credit is the credit given for one hour of lecture or three hours of laboratory work each week for 12 weeks. Hereafter, for brevity, this unit will be known as a "credit."

Class Standing: Forty-eight credits of approved college work in addition to the prescribed entrance requirements, are required for Sophomore rank; 96 credits for Junior rank; and 136 credits for Senior rank. The foregoing figures include the required credits in Physical Education or Military Science.

Registration Dates: For the Fall Quarter students will register on Thursday, Friday and Saturday, September 11, 12 and 13. Classes will begin Monday, September 15.

For the Winter Quarter, all students will register on Monday and Tuesday, December 1 and 2. Classes will begin Wednesday, December 3.

Registration for the Spring Quarter will take place on Monday and Tuesday, March 8 and 9. Classes will begin Wednesday, March 10.

On each registration day, students will be permitted to register according to an alphabetical schedule to be announced later.

Late Registration: Registrations after the last date given above for each quarter are considered late. A fee of one dollar per day will be charged for those who register late, with a maximum fee of five dollars. In case the registration cannot be completed by the prescribed day, owing to some delay caused by the College or its officers, an exemption may be obtained upon application to the Registrar on the regular day of registration. The amount of work for which any student will be allowed to register will be reduced by one and one-half credits for each week or fraction thereof that a student is late in registering.

All classes will be conducted as scheduled up to 5 p. m. on the day preceding a holiday. Likewise all classes will be conducted as scheduled the day following a holiday.

Normal Registration: Fifteen credits, exclusive of one credit of Military Science or required Physical Education is the normal registration for any one quarter.

The registration is construed to include any Extension, Correspondence, Institute, or other work carried by the student for credit or for removal of high school deficiencies during the period of the school year in question.

No student will receive credit for residence work not included on his registration card, which must be filed in the Registrar's Office before the end of the quarter. Students who wish to attend regularly any class for which they are not registered must obtain a visitor's permit from the Registrar's Office. No credit will be allowed for such attendance.

Withdrawal From Classes: The program of courses listed on the student's registration card, approved by his dean and filed in the Registrar's Office, is considered as the student's official registration for the quarter. A student is held responsible for the satisfactory completion of the entire program. Unless an official "Change of Registration" form is filed with the Registrar's Office, F grades will be recorded in case of failure to obtain passing grades in any of the courses for which the student has registered, regardless of the reason for the failure. Changes are considered official only when signed and approved by the instructors of the classes and the dean.

Incomplete Work: Students are required to complete by the end of the quarter all courses for which they have registered. This includes Correspondence courses for which the student may be registered on the residence registration fees. Incomplete grades can be granted by an instructor only when permission is granted by the Attendance and Scholarship Committee before the close of the quarter. The necessary petition forms may be obtained at the Registrar's Office.

Incomplete work must be finished, and a passing grade given in the course, within one year of the close of the quarter, otherwise the credit is forfeited.

Credit by Examination: In special cases, students may be permitted to obtain college credit by passing examinations in subjects not taken in course. This privilege does not contemplate the combination of "visiting" or "auditing" a class with a request for a special examination as a means of acquiring credit. Neither does it contemplate outside assignments or outlines on the part of the instructor being combined with an examination to acquire credit. This privilege is intended to measure informal educational experience that is the possible equivalent of an organized course given in the College.

A maximum of eighteen credits can be acquired by special examination. None of the last thirty credits presented for a B.S. degree may be obtained in this manner. Unless the examination is taken prior to the close of the second week of any quarter for which a student enrolls, the credits gained will be included as part of the student's load for the quarter.

Petition should be made to the Committee on Special Examination on special forms to be obtained at the Registrar's Office.

A student may earn as much credit in the two-week Christmas holiday period as in a similar period in residence, without having it added to his load the preceding or following quarter.

Residence credit shall not be given for off-campus study without special permission of the Deans' Council.

Low Scholarship and Probation. Students who have not maintained an average grade of C or better and students failing to obtain passing grades in 12 or more credits during the preceding quarter are automatically placed in the low scholarship group. No person in the low scholarship group shall be eligible to be elected, appointed, or to hold office in the student body organization.

Students in the low scholarship group are on probation for poor scholarship.

Students on probation who violate the terms of their probation are subject to immediate suspension from the college.

When in doubt regarding any of the regulations affecting them, students on probation should consult with the Attendance and Scholarship Committee. This Commitee, alone, has the authority to waive or modify the terms of probation.

Students in the low scholarship group may not register for more than 15 credits per quarter, exclusive of one hour of Physical Education or Military Science.

Numbering of Courses. The collegiate work of the Institution is divided into three divisions: Lower Division, Upper Division and Graduate. Courses numbered from 1 to 99, inclusive, are Lower Division courses. Those listed from 100 to 199, inclusive, are Upper Division courses. All courses with number 200 or over are graduate courses.

Qualified students may enter courses in any quarter, unless a statement to the contrary appears in the description of the courses.

Lower Division students will not be allowed to enter Upper Division courses except upon approval of the Dean or Adviser and the instructor of the course.

LOWER DIVISION

THE Lower Division comprises the work of the Freshman and Sophomore years. The main purposes of this division are to provide a broad and integrated background in the principal fields of human knowledge, and to fulfill the prerequisites for the major work upon which the student will concentrate in the Upper Division.

Provisions are made in several departments of the College for the issuance of Certificates of Completion for two years of work as prescribed by such departments.

Students who expect to become candidates for the Bachelor's degree should plan their courses with great care through consultation with their faculty advisers, major professors, and deans, to insure the best choice of courses for filling the groups and to provide the proper foundation for their advanced work. Failure to do this may necessitate an extra year to complete the work for the desired degree.

Students should satisfy the following requirements, in order to complete the work of the Lower Division:

1. Remove any deficiencies that may exist in the entrance requirements.

2. Complete 96 credits, or quarter hours of work, (including Military Science and Physical Education) with an average of 75% or higher.

3. Prepare a foundation of at least 15 credits for the field of specialized study in the Upper Division.

4. Satisfy the (A) English, (B) Group, (C) Military Science and Physical Education requirements as follows:

A. English Composition.

1. A special placement examination in English is required of all freshmen.

2. Freshman students in the School of Enginering and Technology and in the School of Forest, Range, and Wildlife Management are required to complete English 17, 18, and 19.

3. All other students are required to complete English 10 or 11 in the sophomore year.

Note: For graduation all students must present nine credits in English Composition. (See Paragraph 6 under "Summary of Requirements for Graduation.")

GROUP REQUIREMENTS

B. Groups: A total of 40 credits must be selected from the following four groups with not less than eight credits nor more than 12 credits being counted in any one group.

1. **Biological Science:** At least eight credits must be selected from the following basic Biological Science courses. Not more than 12 such credits can be counted in the total of 40 required in the four groups.

Bacteriology—any course of Lower Division grade.

Botany 1, 21, 22, 23.

Physiology 4.

Zoology 1, 2, 3, 4.

2. **Exact Science:** At least eight credits must be selected from the following basic Exact Science courses. Not more than 12 such credits can be counted in the total of 40 required in the four groups.

Chemistry—any course of Lower Division grade.

Geology—any course of Lower Division grade.

Mathematics—any course of Lower Division grade.

Physics—any course of Lower Division grade.

3. **Language and Arts:** At least eight credits must be selected from the following basic Language and Arts courses. Not more than 12 such credits can be counted in the total of 40 required in the four groups.

Art 1, 2, 3, 22, 26, 32, 33, 35.

English—any literature course of Lower Division grade.

Landscape Architecture 3.

Language—any beginning course in French, German, Portuguese, Spanish, or Latin.

Music 1, 4, 5, 11, 12, 13, 80, 81, 89.

Speech—any course of Lower Division grade.

4. **Social Science:** At least eight credits must be selected from the following basic Social Science courses. Not more than 12 such credits can be counted in the total of 40 required in the four groups.

Agricultural Economics 53a, 53b, 62.

Economics 51, 52.

History—any course of Lower Division grade.

Psychology 3.

Political Science 1, 10, 70, 71.

Sociology 10, 70.

Majors in departments in the School of Arts and Sciences should see the introduction to the Arts and Sciences section of this catalog for suggested courses with which to fill group requirements.

C. **Physical Education:** Six quarters of work in Physical Education activity classes are required of all women students, and also of all men students who do not take the required courses in Military Science (see Military Science and Tactics).

In departments where there is a prescribed course of study such as in Forestry; Smith-Hughes Teacher Training courses; and in Engineering, Industries and Trades, the completion of such courses shall substitute for the group requirements, provided the student remains in that field.

UPPER DIVISION

NINETY-SIX credits (quarter hours of credit) with an average grade of 75% or higher are required for admission to the Upper Division. Graduates of standard normal schools and junior colleges, and students from other colleges who present at least 90 credits of acceptable college work, in addition to the courses in Physical Education or Military Science required at the institution from which they are transferring, may be registered in the Upper Division.

The completion of the group requirements in any accredited collegiate institution will substitute for the completion of the group requirements at this institution, as prescribed in the section on the Lower Division. This does not apply to students who have been pursuing prescribed courses which do not include the group requirements. Students who change from a prescribed course to a major under the group elective system must complete the basic group requirements as specified in the section on the Lower Division. Transfer students who continue on in a prescribed course will be held for the completion of the Lower Division courses as prescribed at this institution, except as equivalent courses may be accepted as substitutes for our own courses.

Major Subject: The student should select a major subject upon entering, or early the first year, but in no case later than entrance in the Upper Division. As soon as the major subject has been selected, the student should contact the head of the department in which he has decided to major. The head of the department will thereafter act as the student's adviser. The student's registration in each succeeding quarter should be carefully checked and approved by this adviser (called the major professor) in order to insure proper selection and sequence of courses for satisfying institutional and departmental requirements.

The Major Department has the authority to prescribe not less than 30, and not more than 50 credits in the major subject (exclusive of any courses which may have been used to satisfy Lower Division requirements in any of the groups). The Major Department and the Dean shall also prescribe such other related courses as may be considered desirable, provided always that the student's free electives may not be reduced below 36 credits.

Minor Subject: The student is permitted to choose his own minor. The minor shall consist of 18 credits either in one department or in two departments closely related in nature of subject matter, provided that if the minor is in more than one department it must have the approval of the Dean and the Major Professor.

Courses used to satisfy the English composition, the basic groups, military science or physical education, and freshman orientation requirements as specified under the Lower Division cannot be counted in the minimum 30 credits for a major or 18 credits for a minor.

Graduation

The College offers Certificates of Completion for two years of applied work in certain departments, the degrees of Bachelor of Science and Master of Science in all of the Schools of the College; and gives work to fulfill the requirements for all the professional certificates issued by the State Board of Public Instruction.

IMPORTANT: The College reserves the right to change at any time the requirements for graduation, and every candidate for a certificate, a diploma, or a degree shall be held to compliance with such changes, as far as the uncompleted part of his course is affected.

Students are expected to familiarize themselves with institutional rules and regulations. The responsibility for satisfying the requirements for graduation rests upon the students concerned.

Students who do not graduate in the class with which they entered are held to the requirements, including entrance, of the class with which they graduate.

Requirements for the Terminal Certificate

The Schools of Agriculture, of Home Economics, and of Engineering and Technology offer two-year courses in practical studies leading to a certificate of completion, for those who wish to fit themselves better for their vocation and for life, and who are not interested in the regular four-year course leading to the B.S. degree.

In the Schools of Agriculture and of Home Economics the courses are arranged so that the student may, at a later date, complete the four-year course with a minimum loss of time. While these short courses are designed to develop a broader understanding of the sciences underlying these fields and to lay the foundations for good citizenship, they offer a considerable range of selection of practical courses in bother the Lower and Upper Divisions.

The general requirements for this Certificate are:

1. Satisfy the entrance requirements.

2. Complete 96 credits, which includes the required work in Physical Education or Military Science.

3. Complete a Major of 30 credits in one or more closley related departments of the School in which the Certificate is granted.

4. Complete a Minor of 15 credits closely related or basic to the Major field. This need not be in the same school.

5. Complete 24 credits in the basic groups, as follows: Language, nine, which shall include English 10; Exact Science, five; Biological Science, five; and Social Science, five.

6. Complete 21 credits of elective work.

Only Lower Division credit may be obtained for work taken during the short course, even though some Upper Division courses be taken.

For additional information, see descriptions of work in the school concerned.

In the School of Engineering and Technology, definite programs of study are prescribed leading to certificates of completion within definite fields of applied industrial work. These curricula may be found in the section entitled "School of Engineering and Technology."

Requirements for the Degree of Bachelor of Science

The College confers the degree of Bachelor of Science in Agriculture; Forest, Range and Wildlife Management; Arts and Sciences; Agricultural Engineering; Civil Engineering; Commerce and Business Administration; Home Economics; Education; Industrial Education, or Technology upon students who meet the requirements specified herewith:

Before a student can become a candidate for a baccalaureate degree, the abstract of his record in College must show: first, that he has satisfied the entrance requirements as prescribed for the class with which he expects to be graduated; second, that the collegiate work for which he has credit, his conditional and other pending credits, the completion of which is reasonably assured, and the work for which he is registered or is planning to register, together satisfy the requirements for graduation including Physical Education and Military Science as prescribed for his class.

Regular students who are planning to graduate at the next Commencement should consult their major professor and jointly prepare the "Admission to Candidacy" form not later than the fourth week of the Fall Quarter. Students planning to complete their work by part-time and summer school, should prepare their applications when they still have 25 to 35 credits to complete. Students will be admitted to candidacy when the plan of course work presented is found to fulfill all remaining requirements for graduation.

Summary of Requirements for Graduation

For students who will graduate in the spring of 1948, the following requirements must be met after satisfying the requirements for admission. The responsibility for satisfying the requirements for graduation rests upon the student concerned.

1. Six quarters of work in Physical Education for women, provided that the candidates who are officially excused from Physical Education present one credit of other work for each quarter that they have been excused.

2. Six quarters of work in Military Science for men unless officially excused from this requirement. Men exempt from Military Science are required to substitute one quarter of Physical Education for each quarter of Military Science from which they are exempt. If exempt from both Military Science and Physical Education, candidates must present one credit of other work for each quarter they have been exempt.

The advanced course consists of the third and fourth year of Military Science. Entrance upon the advanced course is elective, but once entered upon, the course becomes a prerequisite for graduation, unless the student shall be discharged in accordance with the provisions of Army Regulation 145-10.

3. One hundred eighty credits of acceptable collegiate work, exclusive of the required credits in Physical Education or Military Science.

4. Fifty-four credits of Upper Division work taken after the candidate has presented at least 90 college credits, in addition to the required courses in Military Science and/or Physical Education or their substitutes.

5. The completion of a major, a minor, and related work as outlined under Upper Division.

6. The completion of the group requirements and of the English composition requirements, English 110, or its equivalent, as explained under Lower Division requirements.

Paragraphs 5 and 6 above do not apply to students who are pursuing a prescribed course of study such as in Forestry, Smith-Hughes Teacher Training courses, Engineering and Technology.

7. Each school of the College, subject to the approval of the faculty, shall determine the nature and amount of extension credit accepted for admission and toward graduation with a Bachelor's degree. In no case shall more than 50 percent of the credit submitted for graduation be non-residence credit, including special examination, extension and home study credit. This 50 percent may include one-half home study credit.

8. Applicants for degrees having taken courses for credit in the Extension Division are subject to the regular college instruction requirements and must file transcripts of credit with the Registrar's Office.

9. Candidates for a Bachelor's degree must have studied in residence at Utah State Agricultural College during three full quarters, one of which must be in his Senior year, a full quarter being a quarter in which at least 12 residence credits are earned.

10. Four passing grades, "A," "B," "C," and "D" are employed in reporting credit. No credit with grade lower than "D" can count toward satisfying credit requirements. The maximum number of "D" grades counting as credits shall be 36 credits.

Grade points have been assigned to grades as follows: 3 grade points for each credit of "A," 2 for each credit of "B," 1 for each credit of "C," zero for each credit of "D." A deduction of one grade point will be made for each hour of failure. For graduation, a student must have as many grade points as he has credits for which grades of "A," "B," "C," "D," and "F" have been assigned. Credits of "P" grade are disregarded in computing grade point averages.

11. The candidate must file an "Application for Admision to Candidacy" not later than the fourth week of the Fall Quarter preceding graduation. This application must show the course of study to be followed in order to complete all requirements for graduation, and must be approved by:

(a) The professor in charge of the major subject.

(b) The dean of the school in which the major work is done.

12. The candidate must file an "Application for Graduation" with the Graduation Committee not later than December 2, containing information requested. Any candidate who fails to file his application for graduation by December 2, may be held over to the next year's commencement.

13. The candidates must be of good moral character and must have discharged all college fees.

14. Attendance in person at the Commencement and Baccalaureate exercises at which the candidate expects to secure the degree is mandatory, unless excused in writing by the Graduation Committee for very urgent reasons upon petition from the student.

Requirements for the High School Teacher's Certificate

Students satisfying the following requirements in addition to those for a

standard Bachelor's degree will be recommended by the College for the Professional High School Certificate issued by the State Board of Education.

The candidate must have completed a teaching major of at least thirty credits in a subject which is taught in Utah high schools, at least fifteen credits which must be Upper Division work; and a teaching minor of at least eighteen credits in a subject which is taught in Utah high schools. Or, in lieu of this major and minor, a composite major consisting of not less than sixty credits distributed in three related subjects with not less than eighteen credits in any one subject. The candidate must have completed the following subjects allied to education: three credits in School Health Education, three credits in Physical Education, and two credits in Safety Education. He must have ten credits in each of the four following groups: Language Arts; Physical, or Exact Science; Biological Science; and Social Science. He must complete at least thirty credits in professional education including twelve credits in Secondary Observation and Directed Teaching, to include not less than three credits in Principles and Methods of teaching in High Schools; three credits of Organization and Administration of Utah Schools, three credits of Educational Psychology, three credits of Guidance and Personnel and three credits of Articulation of Schools.

GRADUATE SCHOOL

B. L. RICHARDS, *Dean.*

Objectives and Organization

The Graduate School of the College is organized to serve the educational needs of men and women who have completed their undergraduate work and who desire to qualify themselves for professional services, or who may wish to identify themselves with a program of higher education leading to a teaching or research career. In all advanced work, effort is made to bring the student into direct contact with the basic research and teaching activities in his chosen field to the end that he may obtain a compresenhive view of a specialized field of knowledge together with the training essential for effective teaching or independent investigation. In graduate work the major aim is to develop high standards of creative scholarship rather than to fulfill routine course requirements.

Departments of the College that offer graduate work in related fields or in natural educational areas cooperate (1) to determine the needs for graduate work within the educational areas; (2) to provide fundamental and basic course work or training within the areas; (3) to foster the spirit of scholarship and research and to determine standards of achievement characteristic of the areas involved; and (4) to promote institutional standards and give institutional character to graduate work beyond that which is made possible by independent departmental direction.

Graduate work in the College is directed by a Graduate Council, which consists of the Dean of the Graduate School and seven members of the faculty appointed by the President. The scope of the Graduate School covers all graduate study in the College.

Admission to the Graduate School

A graduate with a Bachelor's degree from the Utah State Agricultural College or from any other accredited college or university may be admitted to the Graduate School. Seniors in the College, who have an average of a "B" or better in all their courses in their junior and senior years and who at the beginning of any quarter lack not more than five quarter credits to complete all requirements for the Bachelor's degree, may be allowed to register for a

limited amount of graduate work. All such courses selected for graduate credit must be approved in advance by the Head of the Department and by the Dean of the Graduate School. Graduate credit will not be allowed if the student's total credit for which he is registered during the quarter exceeds 16 hours.

Students are admitted to graduate studies in social work who have taken a Bachelor's degree with: (1) a major in social work; (2) a major in sociology, economics, political science or psychology, and have a total of not less than 36 credits in these four departments; or (3) a major in child development, physical education, public health or education, and who also have 25 credits in one of the four social sciences above listed with a fair balance among them. Students over 35 years of age are admitted only by special arrangement.

Admission to the Graduate School does not imply admission to candidacy for an advanced degree. Such admission is granted by the Dean of the Graduate School only on recommenation of the Head of the Department and of a special examining and advisory committee as explained below. All students registering in the Graduate School must have their registration card signed by the Dean of the Graduate School. Students who wish to register in the Graduate School should submit their application at least one month before the opening of the quarter in which they plan to matriculate. In all cases, students who are not graduates from the Utah State Agricultural College must provide a certificate of graduation and a transcript of credits from other institutions. If the transcript of credits does not accompany the application, a date should be specified at which time a transcript will be provided. Blanks for making application can be had from the Registrar's Office or from the office of the Dean of the Graduate School.

MASTER'S DEGREE

All approved graduate courses in the College lead to the Master of Science degree. Majors for the Master of Science degree are offered in all the basic biological, physical, and social sciences, and in the various educational, industrial, and professional divisions as follows: Animal Industry, Crop and Soil Science, Education Psychology, Engineering, Irrigation and Drainage, Industrial Education, Forestry and Range Management, Home Economics, and Microbiology. The specific departments, or groups of departments (over 30 in all) in which the Master of Science degree is given, together with the course service provided by the departments, may be determined by consulting the departmental statements provided in the catalog under the various undergraduate schools of the College.

Requirements and Procedures for Obtaining A Master of Science Degree

1. Acceptance for Registration as a Candidate for a Master's Degree. A student who has been registered in the Graduate School for one quarter, and who has satisfied the Department in which he proposes to do his graduate work, may be admitted to candidacy for a Master of Science degree upon the written recommendations of the Head of his Department and of a special examining and advisory committee appointed by the Dean of the Graduate School. All students wishing to become candidates for a Master of Science degree will apply directly to the Graduate Dean. Application blanks are available at the Office of the Dean.

2. Major Professor and Advisory Committee. The applicant will be assigned by the Dean of the Graduate School to a major professor, who in all cases will be a member of the teaching staff of the Department in which the student has chosen to do his major work, and who will be chosen in consultation with the student and the Head of the Department involved. The Major Professor will advise the student in the planning and the prosecution of his course of study and in his research work, and will function as chairman of the

student's Examining and Advisory Committee. This committee will include the Major Professor and at least three other members chosen from the faculty of the Major Department or closely related departments. The Dean of the Graduate School and the Head of the Department in which the student is specializing are ex-officio members of all committees and advisory groups. The committee is responsible for all examinations dealing with the candidate's work.

3. Thesis Director. In instances where the thesis chosen by the applicant is based on research supported by the Experiment Station or by Federal or other outside agencies, the applicant, with the advice of the Major Professor and the Head of the Department, may be assigned to a special Thesis Director. This Thesis Director need not be a member of the teaching staff or of the Major Department in which the student is majoring. He will, however, become a member of the student's committee and will be directly responsible for the student's research and thesis, and will function in this connection with the Major Professor in directing the student's educational program.

4. Qualifying Examination and General Requirements. By study of the records of the student's scholastic work and by special examination, both oral and written, the examining and advisory committee shall satisfy itself as to the adequacy of the student's preparation and advisability of his pursuing graduate work.

No student will be admitted to candidacy who has not received an average of "B" grade in his junior and senior years of undergraduate studies and who has not completed at least one quarter's work in residence with an average of "B" or better. Exceptions may be made where it is shown by the Department that the student has special aptitudes which are not adequately measured by his scholastic record.

5. Program of Study. If the Advisory Committee is convinced that the preparation and ability of the student are such as to give reasonable assurance of success in advanced studies, then the committee under the direction of the Major Professor shall plan a program of study which will meet all requirements for the Master of Science degree. This program must include:

(a) At least three quarters of residence. Four summer sessions with residence research culminating in a thesis may be accepted as fulfilling residence requirements. Under no condition will extension credit or credit transferred from other institutions be permited to shorten the period of residence.

(b) At least 45 credits including the thesis in courses numbered 100 or over approved for graduation in addition to any lower or upper division courses which may be necessary to strengthen the undergraduate preparation in his major and minor subjects. Under no condition will more than 16 credits be allowed for any one quarter with 12 credits as a maximum for one-half time. All courses allowed toward a Master of Science degree must be completed with a grade of "B" or better.

(c) At least 10 credits in courses numbered 200 or above exclusive of work connected with the thesis.

(d) A thesis with 9 to 15 credits.

Any modification of these requirements necessitating action of the Dean of the Graduate School will be considered only if they are submitted by the Major Professor and as part of the student's entire proposed program of study.

The candidate will submit his proposed programs of course study and research and make application to the Dean of the Graduate School on blanks provided at the Office of the Dean of the Graduate School. This application must be accompanied by a critical statement of the student's thesis and by a general plan of his research procedure.

6. Time Limitation for Application. Application for admittance to candidacy must be made before the student has completed more than 16 credits allowed toward his Master's Degree. In this connection it shall be the respon-

sibility of the Department to evaluate the student's scholastic record early in his first or probationary graduate quarter or before completion of his 16 credits and to obtain committee appointment at such a date as will permit committee action in the selection of subsequent courses and of the thesis. Neglect on the part of the department in this responsibility may seriously handicap the student in his subsequent studies. The application for candidacy should be submitted not later than the end of the first four weeks of the quarter preceding that in which the applicant completed his work and is to be graduated.

Notice to admission to candidacy, together with a letter of instructions concerning the thesis form and final examination, will be sent to the candidate by the Dean. A form on which to make application for graduation will also be enclosed with the letter. This form calls for the payment of a fee of $10 for official checking and binding of two copies of the thesis.

Thesis

Each candidate for a Master of Science degree must present a thesis on a topic within the field of his major subject which must represent from 9 to 15 hours of the credit presented for his degree. In all cases, the thesis must represent a contribution to the field of knowledge, based on the student's own research, or a treatment and presentation of known subject matter from a new point of view. After tentative approval by the department, the thesis must be typewriten in a standard form and submitted with a critically written abstract to each of the student's Examining and Advisory Committee at least two weeks before the date of his final examination. A typewritten and a carbon copy of the final draft, properly signed by the Major Professor, the Head of the Department, and the Dean of the Graduate School, must be submitted to the Librarian of the College to be deposited in the Library of the College one week prior to date of graduation. If the student is to be graduated at the June commencement, the thesis must be submitted in its final form by May 20 preceding commencement.

Final Examination

Each candidate for a Master of Science degree will be required to pass a comprehensive final examination on the subjects of his graduate study and on his thesis. This examination may be oral or written or both as his committee may decide, and is open to all faculty members and officials of the Graduate School. Arrangements for the time and place of the examination will be made by the Dean of the Graduate School upon the recommendation of the Major Professor or Head of the Department. A member of the Exaniming and Advisory Committee, other than the Major Professor, or a representative of the Graduate Council, will be appointed to act as chairman of the examination and will submit to the Graduate Council the results of the examination. For candidates who are to receive their degree at the June commencement the date of the final examination should not be later than May 15. When the examination is passed and the thesis submitted and deposited with the Librarian, the Dean of the Graduate School will present the name of the candidate to the College faculty for approval. He will also instruct the candidate regarding attendance at commencement and on other matters relating to his graduation.

Time Limit for Completing Work for a Master's Degree

Work for a Master of Science Degree must be completed within five years from the date of matriculation as a regular student in the Graduate School if the work is done wholly or in part during the regular academic year. If the work is done entirely in summer sessions, a maximum of seven years is allowed. Older work may be revalidated by examination.

Extension Courses

The amount of extension credit to be allowed will be determined in consideration of the student's entire course program. In no case will more than nine quarter hours of extension credit be allowed as counting toward a degree. All extension courses for which graduate credit is sought must be regularly registered for through the Graduate School, and must have the sanction of the Head of the Department in which the student is doing his graduate work. Credit toward a Master of Science degree will not be granted for correspondence study.

Graduation at the Close of the Summer Session

All students who satisfy the requirements for graduation by the close of the Summer Quarter are listed with the class of the following year and will receive their public graduation at the following Commencement. The graduation of such students however, will be certified by the proper authorities of the College as soon as their work is completed.

Teaching and Research Assistantships

A number of teaching and research assistantships in various departments of the College are available each year to graduate students. Teaching assistantships carry a stipend of $675 for one-third time teaching service on a nine-month basis. Remuneration for research assistantships may vary from $675 to $1,200 dependent upon the time of service involved. All assistantships are arranged so as to allow the student to complete work for his Master's Degree in two years. At the present, assistantships are available in the following departments: Agricultural Economics, Botany and Plant Pathology, Bacteriology, Biochemistry, Economics, Public Health, Geology, Physics, Chemistry, Zoology, Entomology and Physiology, Dairy Manufacturing, Sociology, Political Science, Irrigation and Drainage, Physical Education, Foods and Dietetics, Child Development, and Engineering and Technology, Forestry, Range Management and Wildlife Management.

Graduate Division of Social Work

Louisa Y. Robinson National Women's Relief Society Scholarship. A gift of $5,000 has been made to the college by the General Board of the National Women's Relief Society for the purpose of creating a perpetual fund bearing the name of Louisa Y. Robinson, the annual earnings of which are to be given to a Latter-day Saint woman student eligible for admission to the Graduate Division of Social Work. A research paper is required. If the study takes the form of a thesis for a Master's degree including four quarters of residence the award, on the basis of present earnings, is $200. If a less comprehensive study is made which can be completed as a part of regular course work in nine months the award is $150. A transcript of credits and three letters of recommendation are necessary, one of which must be from the ward relief society president of the ward in which the student lives. One hundred dollars is payable May 1, and the rest on completion of the study.

One Graduate Tuition Scholarship of $80 is available to a student meeting the requirements for admission to the Graduate Division of Social Work.

THE DEGREE OF DOCTOR OF PHILOSOPHY

The College offers advanced training leading to a Degree of Doctor of Philosophy in a limited number of fields. With its cooperative connections with the various state and Federal research agencies, the College is well equipped to maintain its leadership in the field of irrigation and drainage, in soil physics and in various other phases of soil science and related fields.

More detailed information may be obtained from the Dean of the Graduate School.

STUDENT EXPENSES
1947-48

Resident Students

	Three Quarters	Winter and Spring	Fall Only	Winter Only	Spring Only
Registration Fee	$ 10.00	$ 10.00	$ 10.00	$ 10.00	$ 10.00
Tuition	51.00	34.00	17.00	17.00	17.00
Student Body	12.00	9.00	6.00	6.00	6.00
Athletic Fee	6.00	4.00	2.00	2.00	2.00
Class Fee	1.00	1.00	1.00	1.00	1.00
Building Fee	20.00	14.00	7.00	7.00	7.00
	$100.00	$ 72.00	$ 43.00	$ 43.00	$ 43.00

If a resident wishes to attend all three quarters but pay fees on a quarter basis, the payments are divided as follows: Fall, $43; Winter, $29; Spring, $28 making a total of $100.

Non-Resident Students

	Three Quarters	Winter and Spring	Fall Only	Winter Only	Spring Only
Registration Fee	$ 55.00	$ 55.00	$ 55.00	$ 55.00	$ 55.00
Tuition	51.00	34.00	17.00	17.00	17.00
Student Body	12.00	9.00	6.00	6.00	6.00
Athletic Fee	6.00	4.00	2.00	2.00	2.00
Class Fee	1.00	1.00	1.00	1.00	1.00
Building Fee	20.00	14.00	7.00	7.00	7.00
	$145.00	$117.00	$ 88.00	$ 88.00	$ 88.00

If a non-resident student wishes to attend all three quarters but pay fees on a quarter basis, the payments are divided as follows: Fall, $88; Winter $29; Spring, $28; making a total of $145.00.

In addition to the above fees, students registered in their respective schools will be required to pay a Materials and Laboratory Fee according to the following schedule:

School of Agriculture	$4.00 per quarter
School of Arts and Science	3.00 per quarter
School of Commerce	2.00 per quarter
School of Education	2.00 per quarter
School of Forestry	4.00 per quarter
School of Engineering and Technology	5.00 per quarter
School of Home Economics	3.00 per quarter

The fees listed above with the exception of the Associated Students (Student Body) fees are the minimum fees required by state law. According to an act passed by the Legislature, all legal residents of Utah who enter the College must pay a registration fee of $10, and, in addition, they must pay a tuition fee of $17 per quarter. Students who are not legal residents of the state are required to pay a registration fee of $55, covering the entire year in addition to the tuition fee of $17 per quarter.

SPECIAL FEES 1947-48

Special Students—Registration fee Plus $2.50 per credit hour (maximum 6 hours)	$10.00
Chemistry Laboratory deposit	5.00
Geology 3, deposit for loss and breakage	5.00
Military Uniform deposit	5.00
Aeronautics—37, 137, 138, 139—$10.00 per clock hour for dual instruction and $8.00 per clock hour for solo instruction.	
Graduation Fee	5.00
Cap and Gown rental:	
Bachelor of Science	1.25
Master of Science	3.00
Terminal Certificate	2.50
Late Registration, per day (maximum $5.00)	1.00
Locker rental	1.50
Master's Degree Fee for binding and proofing thesis	5.00
Teacher placement fee	2.00
Teacher placement re-registration	1.00
Registration as listener in lecture course in which no credit is derived, per subject	5.00
Related Training Courses, 58¢ per clock hour (or per contract with the Veterans' Administration.)	

Graduate students not in residence and wishing to file thesis credit not to exceed 15 hours shall pay a fee of $10.00.

Special examinations may be taken in subjects not registered for, on approval of a special examinations committee, and upon payment of $2.00 per credit hour.

After the first week of each quarter, students changing registration must pay 50 cents for adding and 50 cents for dropping a subject.

Registration is not completed until the student has presented his fee card at the cashier's window, Secretary's Office, and settled for his fees, and filed his registration cards with the Registrar's office.

All students, when paying fees, are given official receipts from the Secretary's Office. These receipts must be presented before refunds are allowed. The students, therefore, should exercise care that the receipts are not lost or mislaid.

All fees except registration fee will be refunded to any student withdrawing from the school by the end of the third week of the quarter. No refunds are allowed after the third week.

According to the constitution of the Associated Students, every regular student must obtain, at time of registration, a Student Body card which will admit him to all activities controlled by the Associated Students; athletic events—football, basketball, tennis and track—dramatics and musical entertainments, socials, lectures, etc., and, in addition, give him a copy of the annual yearbook and a subscription to the College paper. This system has been found to be a great saving to the students and a most excellent means of fostering proper interest in student activities.

Since all women students are required to take Physical Education, they must provide themselves with gymnasium suits and gymnasium shoes. The cost is about $5.00.

Each student in Foods and Dietetics, Home Nursing and Household Administration 150, must provide herself with the following: Two washable white uniforms.

The fee for Course 150—General Home Economics which is required for Home Economics education certification is $35.00 for the one-half quarter residence in the Home Management House.

The College maintains a modern, well-equipped cafeteria, where students may eat at cost.

Good board and room in private homes costs from $10.00 to $12.00 a week. By renting rooms and boarding themselves, students are able to reduce considerably the cost of room and board.

Students are held responsible for any damage done by them to the College property.

SCHOLARSHIPS, FELLOWSHIPS, AWARDS

THE Johansen Scholarship Fund of $5,000, a gift of the late Mrs. Johana Johansen, provides six scholarships annually, worth in the aggregate from $250 to $300, for help of worthy students of Junior and Senior rank. Applications for this scholarship for the succeeding year must be filed with the chairman of the Awards and Honors committee on or before April 1.

The Lieutenant Clyde Parker Baugh Memorial Fund of $10,000, a gift of Mr. and Mrs. Wilford F. Baugh, provides four scholarships annually for deserving students of high scholarship and leadership. Applications must be submitted by April 1 to Awards and Honors Committee chairman.

KSL Meritorious Scholarships. KSL awards two scholarships in the field of radio, one in technical radio work and one in script writing or broadcasting. Applications should be presented to chairman of Awards and Honors Committee by April 1.

The 1927 Class Gift to the College yields an annual income sufficient to provide two scholarships of $125 each. Application should be made by Juniors to the Awards and Honors Committee on or before April 1. Application must be accompanied by an approved outline of a proposed study project to be completed during the senior year and submitted to the Awards and Honors Committee not later than April 1. Two copies of the complete thesis are to be filed in the College library.

The Rhodes Scholarships. A number of candidates for the Rhodes Scholarships in Oxford University, England, are selected each year from the State of Utah. The scholarships are of the value of $2,000 a year, and are tenable for three years. Students who wish to apply for them must have some social and athletic distinction as well as high scholarship in mathematics, science or letters. All applicants must also have three years of French, and it is advisable to have Latin, German, and English history, as well as high school mathematics. Full information and application blanks may be secured at the President's Office or from Professor Sherwin Maeser, chairman of the Rhodes Scholarship Committee. Students who wish to apply for these scholarships are advised to start preparing for them in the freshman year. They are usually given to Seniors or graduate students.

The Danforth Summer Fellowship is awarded jointly by the Danforth Foundation and the Ralston Purina Mills to an outstanding member of the Junior class in the School of Agriculture. The award covers expenses for two weeks in St. Louis and vicinity, and two weeks of leadership training at the American Youth Foundation Camp on Lake Michigan. Forty students from as many colleges are awarded this fellowship. Additional information and application blanks may be obtained from the Dean's office.

Applications for these fellowships should be filed with the Dean of the School of Agriculture on or before April 1.

The Rollo M. Rich Memorial Scholarship is awarded annually to an outstanding student of the senior college who is a major in the school of Agriculture and who has filled a mission for the L. D. S. Church or has otherwise participated in activities of the L. D. S. Church.

Sears Roebuck and Company Scholarships:

For Freshmen in the School of Agriculture the company offers 25 scholarships of $100 each, $50 of which is paid at the beginning of the fall term and $25 at the beginning of the winter and spring terms. Winners are determined on the basis of scholarship, financial need, interest in agriculture, citizenship, moral integrity and rural leadership. The winner of this award who has the best scholarship record at the end of his freshman year will receive an additional scholarship of one or two more years. All applications must be submitted to the Dean of Agriculture before June 1. Application blanks and additional information may be obtained from the Dean's office.

Swift and Company Essay Contest. Each year Swift and Company conducts an essay contest, the winner of which is awarded a free trip to Chicago at the time of the International Livestock show where he will spend approximately a week studying the various phases of the meat packing industry. All essays must be submitted in the Dean's office on or before November 1. Further additional information concerning this contest may be obtained from the Dean's office.

The Leadership Challenge Cup is a gift to the College by Kenneth G. Ikeler and is to be awarded each year to a Senior student in Agriculture who has exhibited the greatest measure of constructive organization and leadership in the School of Agriculture through his College course.

The American Rambouillet Sheep Breeders' Association Challenge Cup was donated to the Animal Husbandry Department by the American Rambouillet Sheep Breeders' Association, to be presented each year to the student showing the greatest efficiency in fitting and showing Rambouillet sheep.

The Ogden Union Stock Yards Challenge Cup is a gift of the Union Stock Yards Company, Ogden, and is awarded each year to the student who shows the most proficiency in the judging of beef cattle.

The Hawaiian Steamship Company's Challenge Cup is a gift of the Hawaiian Steamship Company and is to be awarded each year to the student who shows the most proficiency in the judging of wool.

The Salt Lake Union Stock Yards Company Challenge Cup is a gift of the Union Stockyards Company, Salt Lake City, and is awarded each year to the student who shows the greatest proficiency in judging hogs.

The John K. Madsen Challenge Cup is a gift of John K. Madsen, Mt. Pleasant, Utah, and is awarded each year to the student who shows the most proficiency in the judging of sheep.

Home Economics Scholarships and Fellowships

The Phi Upsilon Omicron Scholarship of $25 is given annually by the Kappa Chapter of that organization to the Freshman girl in the School of Home Economics ranking highest on the following points:

(a) Scholarship.

(b) Participation in student activities.

(c) Service and cooperation.

(d) Leadership.

(e) Moral character.

(f) Judgment and reliability.

In addition, the candidate must be a member of the Home Economics Cub.

Danforth Foundation Home Economics Fellowships: The first, awarded jointly by the Danforth Foundation and the Ralston Purina Company to an outstanding junior in the School of Home Economics. The award provides for two weeks' study of various business problems in St. Louis, followed by two weeks of leadership training at the American Youth Foundation on Lake Michigan.

The second, awarded by the Danforth Foundation to an outstanding freshman in home economics. The award provides two weeks' leadership training at the American Youth Foundation Camp.

The Home Economics Awards—Certificates of merit conferred annually to senior women in Home Economics adjudged worthy by faculty and Senior students upon the following basis:

(a) Application of Home Economics ideals to daily living, 50 points.

(b) Leadership in class work and other activities, 50 points.

The number of awards shall not exceed 5% of the total graduating class. The candidates eligible shall have a grade point average of two or better.

SCHOLARSHIPS AND AWARDS

An Annual Scholarship of $25 will be awarded by the Chi Omega Fraternity to the girl majoring or minoring in the Social Sciences who gives evidence of superior scholarship, and ability to make a contribution to organized group life.

The Committee of Awards shall be appointed by the Chi Omega Fraternity each year from the teaching staffs of the departments of Sociology and Economics.

Medals and Other Awards

The American Legion Military Medal: A gift of the Logan American Legion Post, is awarded each year to the letterman who maintains the highest scholastic record during the year, and who exhibits the most wholesome attitude towards Military training.

The R. O. T. C. Medal, a gift of the institution, is awarded each year to the student in Military Science and Tactics who most nearly represents the ideal that the Reserve Officers' Training Corps is striving to develop, upon the following basis:

(a) Character, 20 points.

(b) Scholarship, 15 points.

(c) College activity, 15 points.

(d) Leadership, 20 points.

(e) Aptitude for and interest in Military Science, 20 points.

(f) Physique and bearing, 10 points.

The Sons of the American Revolution Medal: A gift of the National Society of the Sons of the American Revolution, is awarded each year to the non-letterman, who is a member of the R. O. T. C., and has shown the greatest interest in his military work.

The Utah State Agricultural College Science Medal, a gift of Director Emeritus William Peterson, is given each year to the student writing the best review of recent scientific research in either mathematics, physics, chemistry, geology, zoology, botany or astronomy.

Scholarship A's in the form of gold pins are given at the Awards and Honors Assembly to students who present evidence that their grades are all "A's" for three consecutive quarters of their residence. At least fifteen credits exclusive of basic Physical Education and basic Military Science must be carried. The grades of any quarter can be used but once towards a Scholarship A award.

Alpha Kappa Psi Scholarship Award. Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is established at the Utah State Agricultural College, awards annually the Alpha Kappa Psi Scholarship Medallion to the male student of the Junior Class in Commerce who possesses the highest scholastic average for three years of work taken in this college.

Theta Chi Award. Ten dollars is awarded annually by the Theta Chi Women's Business Fraternity to the Junior girl registered in the Secretarial Science department who has the highest scholastic record in Commerce.

Delta Beta Chi Award. Ten dollars is awarded annually by the Delta Beta Chi Chemistry Fraternity to the Freshman or Sophomore Chemistry student who writes the best essay on some subject in the field of Chemistry.

The William Alger Awards. A gold key is awarded annually by Alpha Epsilon Delta, premedical society, to the outstanding Freshman premedical or predental student. Scholarship, character and possibilities in the field of medicine or dentistry represent the basis for the award.

Blue Key Award. Each year Blue Key Honorary Service Fraternity awards a "service plaque" to an outstanding underclass male student (Freshman or Sophomore). Candidates are judged on college activities, scholarship, service to the College, and moral character. Application forms can be obtained from the organization and must be filed with the Blue Key Awards Committee on or before April 15.

The College Award is conferred annually upon the male student of the institution who shows evidence of being able, in greatest measure, to repay the nation the investment which it has made in him, on the basis of the following rating:

(a) The potential vocational or professional efficiency of the student as shown by his scholarly attainment, industry, natural ability and talent (50 points); and

(b) His patriotism, honesty, and good judgment as a student citizen, as an indication of his future attitude as a voter or public servant, combining a progressive spirit with a love of country and a concern for the safety and development of American institutions of liberty and justice and his qualities of social leadership, as shown in student affairs, based upon physical and moral cleanliness and strength of character (50 points).

A College Award is also conferred annually upon the women student of the Institution who shows evidence of greatest measure of:

(a) Potential vocational or professional efficiency as shown in scholarship, industry, and natural ability (50 points); and

(b) Womanly qualities, development of the social graces, not necessarily social prominence, and attitude of mind (50 points).

Loan Funds

The U. S. A. C. Faculty Women's League has a loan fund for the women students of the college. Loans may range from $50 to $200. Preference is given to Senior women students. Loans are made at any time during the year when money is available.

The Senior Loan Fund, a gift of the class of 1911, and added to by the class of 1922, has helped many students through school.

Rotary Club Senior Loan Fund. The Logan Rotary Club has provided a special loan fund to assist Seniors in meeting their expenses during the last year of their college course. Further information may be obtained from Mr. N. D. Salisbury, First Security Bank, Logan, or the chairman of the Awards and Honors Committee.

The Robert L. Judd Loan Fund was given by Mrs. Judd in honor of her late husband. Loans are available to under graduate men in the College who have ability and are in need of financial assistance. The fund is administered by committee consisting of the Secretary and Treasurer, the Dean of Students, and Mrs. Phillip A. Bullen.

GUIDANCE PROGRAM

The guidance program of the College is concerned with helping the student discover his needs, assess his potentialities, and achieve effective self-direction.

This program is closely integrated with the instructional program of the College. Every member of the faculty serves in some guidance capacity.

The instructional phases of the guidance program is centered in the offices of the academic deans. Each dean in turn selects members of his staff to serve as advisers to the students of his School.

The Dean of Students as Chairman of the Guidance Committee is the general co-ordinator of the entire guidance program. In addition to this, matters pertaining to foreign students, fraternities, clubs, student employment, and personal assistance are centered in his office.

The Dean of Women serves as an adviser to all women students, to foreign students with language handicaps, and to all women's organizations. She also serves as a co-ordinator of campus social affairs and as a supervisor of the college-owned residence halls for women students.

Each sorority house and residence hall is supervised by a competent house mother, who is directly responsible to the Dean of Women. House regulations are drawn up by committees made up of student house managers, student executives, house mothers, and the Dean of Women.

Women students living in apartments in town are urged to report all illness directly to the medical staff or to the Office of the Dean of Women. All students are welcome to bring their individual problems to the office of the Dean.

STUDENT HEALTH SERVICE

The College is interested in the physical welfare of its students. Services of a doctor and a full-time registered nurse are available free of charge to the students. Each new student, upon entering the College, receives a thorough medical examination, and whenever necessary, students are re-examined and advised regarding their physical condition. The College pays for x-rays and emergencies which occur on the campus or during competitive athletics. The physician is on call at all times for illnesses and emergencies occurring off the campus and in student's homes.

SPEECH CLINIC

The Speech Clinic provides special classes to meet the needs of foreign students. Both group and individual instruction at the Speech Clinic can be obtained by foreign students so that they can learn the use of American English as rapidly as possible.

Remedial training is available for those individuals possessing speech handicaps. The types of problems handled include stuttering or stammering, stage fright, slow speech development in children, baby talk, lisping and other disorders of articulation, cleft palate and hare lip, paralytic speech, foreign accent and dialectic speech, "nervous" speech conditions, nasal speech, high or thin

voices, etc. All college students who have defective speech should register with the speech clinic where they will receive immediate attention. This training is also available to non-college students.

PSYCHOLOGICAL CLINIC

The Department of Psychology conducts a psychological clinic whose services are available to students in the College, to the public schools of the state, to child welfare and other public welfare agencies, to juvenile courts and adult probation and parole officers, and to private individuals who may apply for them.

The services include:

1. Educational and vocational guidance.
2. Diagnosis and guidance for gifted, subnormal, and delinquent children.
3. Diagnosis and recommendations for treatment of conduct and personality maladjustments.
4. Diagnosis and recommendations for remedial instruction for achievement difficulties in reading, language, arthmetic, general study habits, and other subjects.
5. Assistance to speech correctionists in the diagnosis and corrective treatment of speech defectives.
6. Administration of tests to determine matriculation status of students who have not completed their high school requirements.

Except for students registered in the College a fee of approximately $3.00 per hour of professional service will be charged, payable to the Secretary-Treasurer of the College. For the participation of trained student help there will be no charge.

MARRIAGE COUNSELING SERVICE

Pre-marital and marital consultation is offered by the Department of Sociology and the Division of Social Work of the College.

COLLEGE CITIZENSHIP

The College expects its student to exemplify those standards of dependability, honor, and integrity which characterize responsible citizens.

"Students are expected to show both within and without the College such respect for order, morality, personal honor, and the rights of others, as is demanded for good citizens. Failure to do this will be sufficient cause for removal from the Association.

. . . *Section 5 of Constitution of the Associated Students of Utah State Agricultural College.*

RELIGION

The officers of the College are deeply interested in the spiritual and moral growth of the students. Every student is encouraged to affiliate with the church of his choice immediately upon registering at the College.

Outstanding religious leaders of the Catholic, Protestant and Latter-day Saint faiths cooperate with the College in serving the students of their respective churches.

The L. D. S. Institute of Religion, which is adjacent to the College, offers accredited courses in religion. The educational and recreational facilities of this religious center are open to all students registered at the College.

SCHOOL OF AGRICULTURE

R. H. WALKER, *Dean*

General Information

THE well trained person is the one who receives employment opportunities in agriculture as well as in other fields of endeavor. Opportunities in crop and livestock production, marketing, extension work, teaching, research, and the various commercial fields connected with agriculture await students who have an adequate background of basic and technical training. Food shortages throughout the world call for increased production and better distribution and for trained personnel to supervise these programs. Better adapted and higher yielding crops and breeds of livestock, better pest and disease control methods are needed to rehabilitate territories despoiled by war. Increase of soil fertility through prevention of erosion, more widespread use of fertilizers, better control of soil moisture are problems awaiting solution by trained men. Thus a great opportunity and a challenge are open to those students who have an interest and an aptitude for agriculture and who are willing to prepare themselves properly.

The Utah State Agricultural College is well equipped to train young men to meet these needs. Along with the technical courses in crop and animal production, agricultural economics and rural social science, soil management, and others, instruction is offered in mechanic arts and in the basic sciences that underlie practical agriculture. Training is also given in English, literature, history, political science, music and the fine arts, hygiene and public health, education and the social sciences, all of which supplement the practical and scientific agricultural training and contribute to the general education of students to a level comparable to that attained by students in other fields.

Instruction includes not only the principles, but also the practice of agriculture. The College farms, dairy manufacturing plant, livestock barns, plant breeding plots, gardens, orchards and technical equipment offer an excellent opportunity for the combination of scientific study and practical experience. Outstanding representatives of the principal livestock and poultry breeds best adapted to Utah conditions afford a "standard of perfection" in desirable type and form for the student judge.

The College maintains an outstanding herd of Hereford and Shorthorn beef cattle. Advance Domino 3d, the present Hereford herd sire, was donated by Sears Roebuck and Company. The Shorthorn herd is headed by an imported bull, Cadet's Guard. Five breeds of sheep, Rambouillet, Columbia, Hampshire, Corriedale and Southdowns, are maintained for comparative study. Duroc swine, registered Percheron horses, and a thoroughbred Remount stallion are also kept. The College dairy herd is made up of purebred Jersey and Holstein-Fresian cattle. S. C. White Leghorns, New Hampshire and Rhode Island Reds and Barred Rocks are available in the poultry yards. In addition to offering teaching material, many students are given experience in the care and handling of livestock.

The Agricultural Experiment Station is bringing to light better methods of feeding, more productive systems of cropping, more valuable strains of fruits, crops and livestock, more remunerative systems of marketing agricultural products, and other improvements. These investigations are studied by the students first hand, and through student employment, a number take an active part in conducting the research work of the Experiment Station. This arrangement gives to the student clearer insight into scientific methods and, at the same time, valuable, practical experience. Special attention is given to improved methods in the various operations of farming, in the use of tools and machinery, and in the management of livestock and crops.

The great practical value of the various curricula of the School of Agriculture is shown by the records of those students who have completed them and who have gone back to the farm, or who, after graduation, have taken up the work of specialists as teachers or investigators. Such men are proving themselves leaders in their chosen work.

Students entering the School of Agriculture may pursue one of four courses leading to the degree of Bachelor of Science in Agriculture.

COURSE IN GENERAL AGRICULTURE

The course in general agriculture is designed to meet the needs of those students who desire a broad general training in scientific and practical agriculture, and wish to qualify for general farming, for extension service, county agent, or agricultural inspection work, or other types of general agriculture. The curriculum for this course is partially prescribed as outlined on this page.

Unless the student has definitely determined the specific phase of agriculture in which he wishes to major it is usually best for him to follow the curriculum in general agriculture for the first two years. Later, when he decides to major in a specific field, he can arrange to do so without serious complications.

COURSE OF STUDY FOR MAJORS IN GENERAL AGRICULTURE

The student majoring in general agriculture will be required to take at least one course in basic agriculture each quarter with a minimum of 12 credits during the freshman year. The prescribed courses and minimum number of credits in the various fields are as follows:

(a) Minimum Requirements in Following Divisions:

	Credits
Agricultural Economics	9
*Plant Sciences	26
**Animal Sciences	26
Agricultural Engineering	9
TOTAL	70

(b) Exact Science, Biology, General Social Science, and Languages.

	Credits	Total
EXACT SCIENCE		
Math 34 or 35	3 or 5	
Chem. 10, 11 & 12 or equiv.	15	18 or 20
BIOLOGY		
Botany 21 & 22	6	
Bacteriology 1 & 3 or 70	5	
Zoology 2 or 3 and 4	5 or 10	
Zoology 112	5	
Entomology 108	5	
Botany 130	5	31 or 36
GENERAL SOCIAL SCIENCE		
Soc. 10 or Pol. Sci. 10, or Hist. 14	5	
Agr. Econ. 52a & 53b	6	11
LANGUAGES AND ART		
English 10 & 110	9	
Language and Arts Group	8	17
		77 to 84

Total credits prescribed	149
Elective	37
TOTAL	186

*Not more than 15 credits of the 26 to be taken in one department, and the total of 26 credits to be selected from each of the four departments: Agronomy, Horticulture, Landscape Architecture and Planning, and Vegetable Crops. Soils 56 is required as part of the 26 credits.

**Not more than 15 credits of the 26 to be taken in one department, and the total of 26 credits to be selected from each of the four departments: Animal Husbandry, Dairy Industry, Poulty Husbandry, and Veterinary Science.

SUGGESTED COURSES FOR MAJORS IN GENERAL AGRICULTURE

AGRICULTURAL ECONOMICS

	Cr.
70—Farm Accounts	3
102—Prin. of Farm Mgt.	3
106—Land Economics	5
110—Marketing Agr. Prod.	3
113—Coop. Marketing	3
120—Agricultural Prices	3

PLANT SCIENCES

Agronomy:

56—Gen. Soils	4
1—General Farm Crops	3
101—Cereal Crops	3
102—Root & Misc. Crops	2
103—Forage Crops	4
107—Fertility & Mgt. Irr. Soils	5
18—Weeds	2

Horticulture:

1—Tree Fruit Prod.	4
8—Small Fruit Prod.	3

Vegetable Crops:

1—Veg. Prod.	4
105—Major Veg. Prod.	4

Landscape Architecture:

3—Elem. Lands. Arch.	3

Range Management:

160—Prin. Mgt. Range Lands	5

AGRICULTURAL ENGINEERING

	Cr.
11—For. & Bench Met.	2
15a—Farm Mach.	3
10—Irrig. Prin. & Pract.	4
105—Woodwork	5
14a—Farm Motors	3

AINMAL SCIENCES

Animal Husbandry:

10—Feeds & Feeding	5
15—Animal Breeding	3
110—Beef Production	3
120—Swine Production	2
125—Sheep Production	3

Dairying:

1*—Gen. Dairy	3
3—Gen. Dairy Ind.	3
6—Market Milk	3
109*—Dairy Prod.	3
110—Dairy Prod.	5

Poultry:

101, 102**—Poultry Pro. & Lab.	4

Veterinary Science:

20—Anatomy and Physiology of Domestic Animals	3

*Students taking Dairy 1 need not take 109.

**Students taking Poultry 1 & 2 need not take 101 & 102.

COURSES IN SPECIALIZED AGRICULTURE

A student may choose to major in one of the following departments: Agricultural Economics and Marketing, Agronomy, Animal Husbandry, Bacteriology and Public Health, Botany and Plant Pathology, Dairy Industry, Horticulture, Landscape Architecture and Planning, Poultry Husbandry, Vegetable Crops, or Zoology, Entomology and Physiology. Information concerning the curriculum for a major in any one of these departments may be obtained from the head of the major department, who should be consulted before registering.

In order to major in these departments, the student must obtain certain basic training and a general view of the entire field of agriculture and meet the requirements of the department in which he chooses to major. To achieve this background and basic training, the student is required to take at least 1 course in basic agriculture each quarter with a minimum of 12 credits during his freshman year. During the four-year period he must complete at least three credits of basic work in each of the following departments:

Agricultural Economics and Marketing
Agronomy
Animal Husbandry
Dairy Industry
Horticulture
Landscape Architecture & Planning
Poultry Husbandry
Vegetable Crops

He must also complete the following courses:

Mathematics 34 or 35
Chemistry 10, 11, 12, or 3, 4, 5
Agricultural Economics 53a and 53b
Sociology 10 or 70, or Political Science 10, or History 14
Language and Arts, 8 credits
English 10 and 110
Agronomy 56

A minimum of 14 credits in the following courses:

Botany 21, 22, 23
Zoology 2, 3 and 4
Bacteriology 1, 3, 70

A total of 186 credits, 54 of which are of upper division grade, are required for graduation from the School of Agriculture.

CURRICULUM FOR TRAINING TEACHERS OF VOCATIONAL AGRICULTURE

This course of study is designed to meet the needs of those students who are planning to teach vocational agriculture in rural high schools. In this curriculum, emphasis is given to practical farm experience, a broad general training in the basic fields of agriculture, and a consideration of methods and techniques of training youth and adults in the vocation of farming.

The broadness and extent of the training is such that a major part of this program is prescribed. This curriculum has been planned to meet the Utah "Requirements for Certification" as effective September 1, 1946.

PRESCRIBED COURSE OF STUDY FOR MAJORS IN VOCATIONAL AGRICULTURAL EDUCATION

Institutional and General Requirements

Exact Science:	Cr.	Tot.
*Chemistry 10, 11, 12	15	
*Physics 3	5	
*Mathematics 34	3	23
Biological Science:		
*Botany 21, 22	6	
*Zoology 2	5	
Zoology 112 (Genetics)	5	
*Bacteriology 1, 3 or 70	5	21
Language and Arts: (Select 8 Credits)		
*Landscape Architecture 3	3	
*Speech or	5	
*World Literature	5	
Journalism	3	11
English:		
Sophomore Composition (10)	5	
Advanced Composition (110)	4	9
Social Science:		
*Agr. Econ. 53a, 53b	6	
*Rural Sociology or		
*Political Science 10	5	11
		75

*Meets lower division group requirements

Basic Requirements in Agriculture

Animal Industry:	Cr.	Tot.
Animal Husb. 10	5	5
Plant Industry:		
Agronomy 56	4	4
Agricultural Economics:		
Ag. Econ. 102	3	
Principles of Marketing	3	6
Agricultural Engineering:		
Ag. Eng. 10	4	4

Basic and Minimum Requirements in Agricultural, Agricultural Engineering and Education Divisions

Animal Industry†	Cr.	Tot.
Basic courses	5	
Elective	15	20
Plant Industry†		
Basic (Soils 56)	4	
Elective	16	20
Agricultural Economics		
Basic	6	
Elective	6	12
Agricultural Engineering (Including Irrigation)		
Basic	4	
Elective	16	20
Applied Entomology and Plant Pathology	Cr.	Tot.
Elective	10	10

EDUCATION

Basic		
Education 112, 113, 114, 125, 126	22	
Psychology 102	5	
School Health 155	3	
Elective	3	33

Total Requirements

Agriculture	82
Education	33
Institutional and General	75

†Basic courses must be elected from at least two departments

TECHNICAL COURSES IN AGRICULTURE

For students who plan to do graduate work or to enter into a field of employment where technical training is required, a technical course is provided in each of the following fields: Agricultural Economics, Animal Husbandry, Bacteriology, Botany, Dairy Husbandry, Dairy Manufacturing, Horticulture, Landscape Architecture, Poultry Husbandry, Soils, Vegetable Crops, and Zoology, Entomology and Physiology. Students may register for these courses only upon permission of the head of the department and permission from the Agricultural Council. Minimum requirements of six credits each in Plant Industry, Animal Industry and Agricultural Economics must be met by students taking these courses.

NON-DEGREE COURSE IN AGRICULTURE

The School of Agriculture also offers a two-year non-degree course in practical agriculture for those students who do not wish to take more than two years of college work. A student may register for any of the regular non-prerequisite production, marketing and management courses in the School of Agriculture. Emphasis in these courses is placed on the practical problems confronted on the farm.

SUGGESTED COURSES OPEN TO STUDENTS IN THE NON-DEGREE COURSE IN AGRICULTURE

Agricultural economics 53a, & 53b, 70, 102, 110.
Agricultural engineering 10, 14a, 15a
Agronomy 1, 56
Animal husbandry 1, 10, 15
Dairy husbandry 1, 3
Horticulture 1, 8
Landscape architecture 3
Poultry husbandry 1 & 2
Vegetable crops 1
Veterinary science 10

Besides completing a 20-credit major in either the plant sciences, the animal sciences, or agricultural economics, the student is required to take six credits in the groups in which he does not major. For example, a student majoring in animal science must complete in addition to 20 credits in his major field, 6 credits in plant science, 6 credits in agricultudal economics, and 6 credits in agricultural engineering. He is also required to take the following courses:

	Credits
English 2	3
English 10	5
Math. 34	3
Pol. Science 10, or History 14, or Rural Sociology 10	5

Students in the non-degree course must complete 90 credits to obtain a certificate.

Agricultural Economics and Marketing

Administered jointly by the School of Agriculture and the School of Commerce

W. P. THOMAS, G. T. BLANCH, *Professors;* DEE A. BROADBENT*, G. A. CARPENTER, *Associate Professors;* E. M. MORRISSON, *Assistant Professor;* M. H. TAYLOR, *Farm Labor Supervisor;* H. R. HOCHMUTH, *Collaborator in Research.*

Students majoring in the Department of Agricultural Economics and Marketing may be graduated from either the School of Agriculture or the School of Commerce. The choice of school should be determined by the field in which the student intends to do his minor work.

Those graduating from the School of Agriculture must satisfy requirements for graduation from that School in addition to other courses prescribed by the major professor. Those graduating from the School of Commerce must, in addition to satisfying the requirements for graduation from that school, include certain basic agricultural courses to be prescribed by the major professor.

In order to meet the requirements of students who plan to do graduate work or to enter into a field of employment where technical training is required, a special course has been provided for such students majoring in agricultural economics. Students satisfying requirements as prescribed for this course may graduate from either the School of Agriculture or Commerce. A schedule for this prescribed course may be obtained from the office of the Department of Agricultural Economics.

Master of Science Degree. The Department of Agricultural Economics offers opportunity for research and graduate study leading to a Master of Science Degree. The research facilities of the Department for training of graduate students are greatly augmented by the investigations conducted in the field of agricultural economics by the Department staff with the assistance of graduate students. The following courses of the 100 series may be used for graduate credit by students majoring in the Department of Agricultural Economics: 102, 105, 106, 113a, 113b, 114, 116, 120, 121. For graduate students in other departments the following courses in the 100 series may be used for graduate credit: 102, 104, 105, 106, 113a, 113b, 110, 114, 116, 120.

Rural Economy

53a, 53b. Principles of Economics. An introductory course in basic principles of Economics with emphasis on those principles which are of particular importance in Agriculture and Forestry. Three credits each quarter.

53a. Fall, Sec. 1, M. W. F. 8; Sec. 2, T. Th. 8, M. 12; Sec. 3, M. W. F. 10; Sec. 4, M. W. F. 1. Winter, Sec. 1, M. W. F. 8; Sec. 2, T. Th. 9, M. 12; Sec. 3, T. Th. 10, F. 12; Sec. 4, M. W. F. 11. *Staff*

53b. Winter, Sec. 1, M. W. F. 8; Sec. 2, T. Th. 8, M. 12; Sec. 3, M. W. F. 10; Sec. 4, M. F. W. 1. Spring, Sec. 1, M. W. F. 8; Sec. 2, T. Th. 9, M. 12; Sec. 3, M. W. F. 10; Sec. 4, M. W. F. 11. *Staff*

54. Principles of Agricultural Economics. An introduction to agricultural economics with emphasis on the application of economic principles to the solution of agricultural problems. Three credits. Fall, T. Th. 9, F. 1. *Blanch*

104. Economic Development of Agriculture. An economic analysis of the geography and use of agricultural resources with special reference to the United States. Three credits. Fall, M. 1, T. Th. 10. *Blanch*

230, 231, 232. Public Problems in Agriculture. Seminar courses designed to familiarize students with the economic implications of problems confronting agriculture. Special references will be made to post war problems in agriculture. Two credits each quarter. W. 2-4. *Thomas*

*On leave.

Farm Management, Land Economics, and Agricultural Finance

70. Farm Accounts. Farm accounts and their application to the organization and management of farms and to the filing of income tax statements. Three credits. Fall, T. Th. 8, Th. 1-3; Winter, T. Th. 8, Th. 1-3. *Staff*

102. Principles of Farm Management. The principles underlying the organization, management, and financial success of farms. Rates of production, labor efficiency, combination of enterprises and farm layout will be discussed. Three credits. Winter and Spring. Winter, M. W. F. 9; Spring, M. W. F. 8. *Blanch*

105. Agricultural Finance. The principles of agricultural credit. Emphasis is given to problems and methods of financing agriculture. Three credits. Fall M. W. F. 11. *Morrison*

106. Land Economics and Utilization. The economic principles underlying the utilization, valuation, and tenure of agricultural land. Attention is given to prevailing land policies and to methods and techniques involved in dealing with problems of land use. Five credits. Spring, Daily 9. *Blanch*

202. Advanced Farm Management. Designed primarily to give students advanced training and experience in farm management. Prerequisite: Agr. Econ. 102. Three credits. Spring, M. F. 2-4. *Blanch*

205. Advanced Agricultural Finance. Designed primarily to give students advanced training and experience in the field of agricultural finance. Prerequisite: Agr. Econ. 105. Three credits. Winter, M. W. F. 1. *Morrison*

206. Land Appraisal and Classification. A basic course in land appraisal and economic classification of land. Two credits. Spring, T. Th. 2-4. *Blanch*

Marketing and Prices

62. Principles of Marketing. A basic course designed for students in Commerce, Home Economics, and Agriculture. Five credits. Winter, Sec. 1, Daily 9; Sec. 2, Daily 10. *Blanch*

110. Marketing Agricultural Products. Principles, problems and methods of marketing agricultural products. Three credits. Fall, M. W. F. 9. *Staff*

113a. Farm Cooperatives. Principles underlying the organization, operation, and management of cooperative sales, purchasing and service associations. Three credits. Spring, M. W. F. 11. *Thomas*

113b. Analysis of Farm Cooperatives. For students who desire detailed work in organization and management of cooperatives. Prerequisite: Agr. Econ. 113a. Two credits. Spring, Th. 11, Lab. arranged. *Thomas*

114. Marketing Fruits and Vegetables. Production and marketing factors as they relate to the marketing of fruits and vegetables with special references to Utah conditions. Three credits. (Not given 1947-48.)

116. Marketing Livestock and Livestock Products. Production and marketing factors as they relate to the marketing of livestock and livestock products with special reference to Utah conditions. Fall, M. W. F. 10. Three credits. *Staff*

120. Agricultural Prices. The relationship between agricultural and non-agricultural prices and income, together with the state and national agricultural outlook reports, will be given consideration. Three credits. Spring, T. Th. 8, F. 1, *Thomas*

121. Price Analysis. A study of statistical and other methods used in analyzing prices and other economic data. Three credits. Winter, M. W. F. 11. *Staff*

262. Advanced Marketing. Designed primarily to give students advanced training and experience in the field of marketing. Prerequisite: Agr. Econ. 62 or 110. Three credits. Spring, T. Th. 10, Lab. arranged. *Staff*

General Graduate Courses

210a. Research Methods in Agricultural Economics. Three credits. Fall, T. Th. 3-5. *Blanch*

210b. Methods and Techniques Applied to Research in the Field of Agricultural Economics. Prerequisites: Agr. Econ. 210a. Two credits. Winter, T. 2-4. *Blanch*

214. Research in Agricultural Economics. Thesis. Any quarter. Time and credit arranged. *Staff*

215. Special Problems in Agricultural Economics. Any quarter. Time and credit arranged. *Staff*

Agronomy

R. J. EVANS, *Professor Emeritus;* D. W. THORNE, D. S. JENNINGS, D. W. PITTMAN, A. F. BRACKEN*, D. C. TINGEY, *Professors;* H. B. PETERSON, *Associate Professor;* G. L. STOKER, LEMOYNE WILSON, W. H. BENNETT, *Assistant Professors;* GOLDEN KILBURN, *Extension Conservationist;* J. W. CARLSON, WESLEY KELLER, O. J. KELLEY, J. L. HADDOCK, M. W. PEDERSEN, J. P. THORNE, C. W. LAURITZEN, R. W. WOODWARD, *Collaborators in Research, U. S. D. A.*

Study and research in the Agronomy Department are built around the problems of crop production in arid regions. The course offerings emphasize the interrelations of plants, soil and irrigation water in the production of maximum crop yields under a variety of conditions. Three types of major study are offered: General Agronomy, Technical Soils and Technical Crops.

A major in General Agronomy prepares the student for positions related to the management of soil and the field production of crops. Students interested in soil conservation work usually major in general agronomy but may partially specialize in either crops or soils. This training is preparatory to such positions as agronomists, conservationists, farm planners, or soil scientists. Many agronomy majors are employed as field men for sugar beet companies, seed companies, fertilizer distributors, and canning companies. Special curricula have been worked out with a major in General Agronomy for preparing the student for such field work. Studies in General Agronomy are also designed to meet the needs of students who desire to farm, to be county agricultural agents, or to take field positions related to soils or crop production with various other state and federal agences.

Majors in Technical Soils or in Technical Crops are prepared for graduate work or technical employment in the two fields. Students of high scholastic standing and with special interest in the fundamental sciences will find distinct opportunity in these fields of study.

Special emphasis is given in graduate research and study to crop improvement, soil fertility and soil technology, and moisture relations of soils and plants as they pertain to arid and irrigation agriculture.

The Agronomy Department offers work toward the Master of Science Degree in various phases of plant breeding and crop production, soil science, and soils and irrigation. The following courses in the one hundred series are acceptable for graduate credit for Master of Science Degree condidates in the department: 109, 115, 155, 160, 170. The following courses in the one hundred series are acceptable for graduate credit for Master of Science Degree candidates in related departments: 101, 102, 103, 107, 109, 114, 115, 125, 155, 160, 170.

*On leave.

A SUGGESTED COURSE IN GENERAL AGRONOMY

Freshman

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Math. 34	3	Ag. Econ. 53b	3	Bacteriology 1 & 3	5
Ag. Econ. 53a.	3	Math. 35	5	Math. 46	5
Botany 21	3	Botany 22	3	Poultry 1	3
Agron. 1 or Hort. 1	3	Veg. Crops 1 & 2	4	Botany 23	3
Landscape 3	3	Electives	2	Electives	1
Electives	2		17		17
	17				

Sophomore

Zoo. 2	5	Eng. 10	5	Chem. 5	5
Geol. 3	5	Chem 4	5	Agron. 56	4
Chem. 3	5	Dairy 1	3	Chem 12	2
Agron. 18	2	Language & Arts	3	Electives	2
	17		16		16

Junior

Agron. 107	5	An. Hus. 10	5	Ent. 108	5
Agron. 101	3	Agron. 102	2	Agron. 103	4
Ag. Eng. 10	4	Agron. 115b	3	English 110	4
Agron. 115a	3	Soc. Sci.	5	Agron. 114	3
Electives	2	Electives	2		16
	17		17		

Senior

Zoo. 112	5	Agron. 112	1	Agron. 109	4
Botany 130	5	Agron. 155	3	Agron. 125	3
Agron. 111	1	Agron. 160	3	Ag. Econ. 102	3
Electives	6	Electives	9	Electives	7
	17		16		17

NOTE: See School of Agriculture requirements on page 67.

By special permission, Chem. 10 and 11 may be substituted for Chem. 3, 4 and 5. Chem. 121 and 122 may be taken instead of Chem. 12.

All majors in Agronomy are required to take the following courses: Agronomy 101, 102, 103, 56, 107, 111, 112, 155, Bot. 23, Math. 46.

Majors in technical soils will be required to take the following courses: Chem. 117, 118, 121, 122; Math. 99; Physics 20, 21, 22; Agron. 115, 114, 125; and Geol. 3 in addition to courses listed for all majors. Suggested program of courses available from the department upon request.

Majors in technical crops will be required to take the following courses: Chem. 121 and 122, Botany 30 and 120 or 130, Agron. 109 and 115 in addition to those listed for all majors. Suggested program of courses available from the department upon request.

FARM CROPS

1. General Farm Crops. Introductory course in crop production. Three credits. Fall, Winter, T. Th. 8, Lab. W. 2-5. *Staff*

4. Commercial Grading. Application of the Federal Standard in the grading of field crops. Two credits. Fall, Lab., W. 2-5, and one Lab. arranged. *Staff*

18. Weeds. Identification of weed seeds and plants, the weed problems in agriculture and methods of control. Two credits. Fall, Th. 9; Lab., Th. 2-5. An assessment will be made for field trips. *Tingey*

101. Cereal Crops. The classification, history and cultural methods involved in production of cereal crops. Three credits. Fall, T. Th. 10; Lab., T. 2-5. *Tingey*

102. Root and Miscellaneous Crops. Sugar beets, potatoes, cotton, tobacco, mangels, and other root crops are studied in detail as to cultural methods, market types, and commercial possibilities. Two credits. Winter, T. Th. 8. *Staff*

103. Forage Crops. Alfalfa, clovers, grasses and other farm forages; classification and methods of production, harvesting and storage; meadow and pasture management, are discussed. Attention is given to the place of these crops in rotation, soil conservation, and erosion control. An assessment will be made for field trips. Four credits. Spring, M. W. F. 8; M. or T. 2-5. *Evans*

105. Seed Analysis and Testing. Impurities of farm and garden seeds; methods of analysis and testing; the inspection and marketing of seeds. Not given except on application of three or more students. Any quarter. Two or more credits. Two or more laboratory periods a week. Time arranged. *Tingey*

109. Plant Breeding. The principles and practices of plant breeding, technique and improvement by selection and hybridization. Prerequisite: Zoo. 112. Four credits. Spring, M. W. F. 11; Lab., W. 2-5. *Tingey*

124. Advanced Judging, Grading and Identification. Prerequisites: Agron. 104 and 118. Two credits. Spring. Time arranged. *Staff*

201. A. Pastures and Hay; B. Alfalfa; C. Sugar Beets and Potatoes; D. Cereals; E. Weeds. This course deals with technical phases of recent advances in crop production and improvement. Time arranged. Each subject carries one credit. The sub-topics are taught by different members of the Farm Crops Staff.

209. Advanced Plant Breeding. The science and practice of plant breeding. Original papers and lectures. Three credits. Spring, two lectures, one laboratory, time arranged. This course alternates with Agron. 201. *Tingey*

213. Crops Seminar. Current scientific topics in farm crops. Required of all graduate majors. Fall, Winter, Spring. One credit each quarter. Time arranged. *Crops Staff*

SOILS

56. Introductory Soils. Fundamentals of soils with a brief study of soil fertility and management problems. A beginning course for students in agriculture. Prerequisite: Inorganic Chemistry. Four credits. Fall, Spring, M. W. F. 9. Lab., M. 2-5 or T. 2-5. *Thorne and Peterson*

57. Introductory Soils Laboratory. Offers credit for the laboratory of Agronomy 56 for students who have had a general soils course without a laboratory. One credit. Given the same time as Agronomy 56 laboratories.

58. General Soils. Fundamentals of soils with emphasis on range and forest soil problems. Designed for students in forestry and range management. Prerequisite: Inorganic Chemistry. Five credits. Spring M. T. W. Th. 11. Lab., W. 2-5. (Credit not given for both 56 and 58.) *Pittman*

100. Soil Microbiology. Microoganisms are considered in relation to their role in soil fertility and organic matter decomposition. Graduate students who have taken Bacteriology 111 may arrange with the professor in charge for graduate credit, and register for 200. Where possible this course should be accompanied by Bacteriology 101. Prerequisites: Bacteriology 1, 2 or 70; Agronomy 56; Organic Chemistry. Three credits. Winter, M. W. F. 11. *Stevens*

107. Fertility and Management of Irrigated Soils. Methods and amounts of irrigation water application in relations to soils and crops. Fertilizer selection and usage in relation to irrigation and soil management. The management and reclamation of saline soils. Organic matter maintenance in soils. Prerequisite: Agronomy 56. Five credits. Fall Daily 8. Winter Daily 10. *Staff*

114. Soil Survey and Land Classification. The influence of environmental factors of soil profile development. Soil and land classification, the methods of mapping soils and the preparation and interpretation of soil type, alkali and land classification maps as related to Utah conditions. Field trips will be made to study the soils of the state. Prerequisite: Agronomy 56 or previous arrangement with instructor. Three credits. Spring, M. 1., M. W. 2-5. *Wilson*

125. Soil Conservation. Special problems of soil management and land policy in relation to soil conservation. Practice in making use of soil conservation surveys in planning farms on a soil conservation basis. Prerequisites: Eight credits in soils and six credits in farm crops. Three credits. Spring, T. Th. 8; Lab., Th. 2-5. *Peterson*

150. Special Problems. Three credits. Arranged. *Staff*

155. Soil and Plant Relations. Plant and soil relationships with respect to physical environment and the availability and absorption of minerals. Laboratory in soil and plant analysis in relation to soil productivity. Prerequisite: Agronomy 56. Three credits. Fall, T. Th. 9. Lab. W. 2-5. *Thorne*

160. Genesis and Morphology of Soil. Soil development is influenced by parent material, climate, time, vegetation and topography. Relationship between the soil groups and their use in agriculture. Course for advanced undergraduates and graduate students. Three credits. Winter, M. W. F. 9. *Jennings*

170. Special Soil Management Problems. The application of theory in the solution of practical soil management problems. Two credits. Winter, T. Th. 9. *Staff*

212. Seminar. Review of current literature in soil science. Required of all graduate students in soil science and open to staff members. One credit per quarter. Time arranged. *Soils Staff*

214. Soil Physics. The fundamental laws of physics are reviewed, with emphasis on mechanics and thermodynamics and their relation to soil problems. Some time is devoted to significant features of modern physics with particular reference to the theories of surface forces as they influence the behaviour of soil colloids. Special attention is given dynamics of soil moisture. A knowledge of elementary physics and mathematics as well as a good foundation in soils are essential. Three credits. Winter, M. W. F. 8. *Gardner*

224. A. Management of Irrigated Soils.
B. Saline and Alkali Soils.
C. Range and Forest Soil Problems.
D. Soil Classification.
E. Genesis and Morphology of Soils.
F. Soil Conservation.
G. Soil Chemistry.
H. Soil Physics.

Reading assignments and discussions of important papers within restricted fields. Open to graduate students in Agronomy or to other graduate students with proper qualifications by special permission. Two hours credit each. Time arranged. *Staff*

227. Modern Techniques in Soil Research. Readings and discussion in theory and practice in the use of recently developed field and laboratory equipment used in research in the field of soils. Laboratory practice is given in the direct operation of equipment discussed and in the interpretation of data obtained. Three credits. Winter, T. Th. 1, T. 2-5. *Staff*

SPECIAL COURSES

111, 112. Agronomy Seminar. Review and discussion of current agronomic problems and practices. Required of all seniors in department. One credit each quarter. Fall, Th. 11. Winter, T. 1. *Staff*

115a. Biometry. Application of statistical principles to the design of biological experiments and the analysis of the data. Prerequisite, Math. 35, or its equivalent. Three credits each quarter. *Tingey*

115a. Fall, M. W. F. 1.

115b. Winter, M. W. F. 8.

116. Dry Farming. Principles of dry farming from practical and scientific standpoints; a survey of agricultural work in the Great Plains and the Mountain regions; and analysis of the possibilities in typical climatic areas, and on important soil types. Three credits. Spring, M. W. F. 9. (Not given 1947-48.) *Bracken*

117. Geography of Agriculture. A brief review of the fundamental principles of climatic controls. The principal agricultural regions of the world will be studied from the standpoint of their topography, climate, soils, crops, livestock, population and industries as related to agriculture. Three credits. Winter, M. W. F. 11. *Pittman*

215. Experimental Methods in Agronomic Research. The design of experiments, technique and methods of procedure, analysis and interpretation of results. Open to approved senior college students. Three credits. Spring, time arranged. *Staff*

218. Special Problems. Special problems in crop production, crop breeding, soil fertility or other phases of agronomic work will be investigated. Students will make a review of the literature on the problem and conduct experiments in the laboratory or on field plots. Any quarter. Time and credit arranged. *Staff*

230. Research and Thesis. Outlining and conducting research in soils or farm crops and preparation of thesis. Any quarter. Two or more credits each quarter. *Staff*

Animal Husbandry

L. L. MADSEN, A. C. ESPLIN, G. R. HENDERSON, T. D. BELL, *Professors;* L. E. HARRIS, *Associate Professor;* J. A. BENNETT, M. BROADBENT, *Assistant Professors.*

Students majoring in Animal Husbandry will be expected to complete courses Nos. 1, 5, 10 and 15, and 40 during the Freshman and Sophomore years, and courses 110, 125, 150, 160 and 165 during the Junior and Senior years.

For those students who plan to take up livestock production, county agent work, vocational agricultural teaching or some similar field of work, a minor in Agricultural Economics, Agronomy, Dairy Husbandry, Poultry Husbandry or Range Management is recommended.

Graduate work leading toward the master of science degree is offered in animal breeding, nutrition, and production. Courses numbered 200 and above are designated for graduate students. Courses 110, 120, 125, 150 and 155 may be used for credit by graduate majors in related departments and by graduate majors in Animal Husbandry by permission of the head of the department. Students who plan to do graduate work may be admitted to the technical course in Animal Husbandry by permission of the head of the department and the dean. For such students a minor in chemistry, physiology or zoology is suggested.

1. Fundamentals of Animal Husbandry. Planned to give an understanding of livestock production in relation to other phases of agriculture in the United State and Utah, the influence of geographical location and conditions upon livestock production, the various types of farm animals and the functions performed or products produced, and an introduction to the important factors in the successful production of livestock. Three credits. Fall, Spring, M. W. F. 1. *Madsen*

5. Livestock Judging and Selection. A study of animal form and its relation to the function of the animal. Emphasis is placed on the evaluation of the live animals in terms of their probable value for the production of meat, wool or work. Emphasis will be placed on judging for both commercial and showing purposes. Spring. One credit, F. 2-5; three credits, M. W. F. 2-5. *Staff*

10. Feeds and Feeding. A study of the differences in digestive tracts of farm animals and the physiology of digestion and feed utilization, the composition of feeds, the balancing of rations, and a brief discussion of the feeding of cattle, horses, sheep and swine. Five credits. Winter, Spring, Daily 8. *Harris*

15. Fundamentals of Animal Breeding. A study of the fundamental principles of livestock improvement, including physiology of reproduction, heredity, variation, selection, inbreeding, cross breeding and other closely related phases of the subject. Three credits. Fall, Winter, M. W. F. 9. *Bennett*

20. Fur Farming. A study of the breeding, feeding, diseases, management and marketing of furs of the various domestic fur animals, especially foxes, mink and rabbits. Two credits. Winter, T. Th. 10. *Harris and Miner*

40. Fitting and Showing Livestock. A study of current methods of fitting and training livestock for showing. Each student will prepare one animal for show and exhibit it in the fitting and showing contest held during the spring quarter. One credit. May be repeated. Spring, T. or W. 2-5. *Bennett*

110. Beef Production. A study of the factors involved in the economical production of beef cattle, including organization of the enterprise, breeds of beef cattle, selection of suitable breeding stock, production of maximum calf crop, handling and feeding of animals of different ages on the range and in the feed lot, and the marketing of surplus stock. Prerequisite: A. H. 10. Three credits. Fall, M. W. F. 8. *Staff*

115. Horse Production. A study of the factors involved in the economical production and use of draft and light horses, including breeds of horses, breaking and training, feeding, breeding, housing, handling and marketing. Prerequisite, A.H. 10. Two credits. Winter, M. W. 11. *Bennett*

120. Swine Production. A study of systems of production with emphasis on those suited to western conditions, breeds of swine, the management and feeding of the breeding herd, and feeding for market. The relation of the industry to dairy farming is discussed. Prerequisite: A. H. 10. Two credits. Winter, T. Th. 9. *Bennett*

125. Sheep Production. A study of both range and farm sheep, with emphasis on range production. Includes methods of production of lambs and wool, grading and marketing practices, feeding and studies of the breeds of sheep and their adaption to the different husbandry practices. Prerequisite, A. H. 10. Three credits. Winter, M. W. F. 10. Spring, M. W. F. 9. *Staff*

150. Animal Nutrition. Attention will be given to various fundamental phases of animal nutrition, including protein, carbohydrate, fat and mineral metabolism, vitamins, content and deficiencies of range forage, and feed and forage poisoning. Prerequisites: Chem. 10, 11, 12 (or equivalent), and An. Hus. 10, or Biochemistry. Four credits. Fall, M. T. W. F. 9. *Madsen*

151, 251. Nutritional Diseases. Special consideration will be given to cause, detection, treatment and prevention of the major nutritional diseases of laboratory and farm animals. Prerequisite: An. Hus. 150. Three credits. Winter, M. W. F. 1. *Madsen*

155. Advanced Animal Breeding. Attention will be given to various fundamental phases of physiology of reproduction, genetics, breeding systems and to problems arising in breeding operations. Prerequisite, A. H. 15 or Zool. 112. Three credits. Spring, M. W. F. 10. *Bennett*

160. Livestock Production Problems. Attention is given various problems in livestock production, particularly those existing in Utah. Students will be expected to apply knowledge acquired in previous courses in the solution of problems they will face in the field after graduation. Prerequisites, A. H. 110 and 125. Three credits. Winter, M. W. F. 8. *Staff*

165. Advanced Livestock Judging. A continuation of the training begun in A. H. 5, and designed to give students intensive training in livestock judging and selection. The Livestock Judging Team will be selected from among the students taking this course. Prerequisite, A. H. 5. Three credits. Fall, M. W. F. 2-5. *Staff*

175, 275. Wool Technology. The methods of marketing and manufacturing of wool, and the various laboratory techniques used in the study of wool. Methods of grading, scouring, and measuring length, diameter, crimp, density, tensile strength and other characteristics are included. Prerequisite, A. H. 125. Three credits. Winter, T. Th. 10; Lab. Th. or F. 2-5. *Staff*

200. Problems in Animal Breeding. Consists of special assignments, reports and discussions. Students are expected to review literature in various phases of animal breeding, and to prepare a comprehensive and critical review of at least one phase of the subject. Two to six credits. Fall, Winter or Spring. Time arranged. *Bennett*

210. Problems in Animal Nutrition. Same as A.H. 200, except work will be in animal nutrition. Two to six credits. Fall, Winter or Spring. Time arranged. *L. L. Madsen and Harris*

220. Problems in Animal Production. Same as A.H. 200, except work will be in animal production. Two to six credits. Fall, Winter or Spring. Time arranged. *Staff*

230. Animal Breeding Research. Students are expected to outline a research problem in some phase of animal breeding, making a critical review of pertinent literature, collect, analyze the necessary data and prepare a report of the work done. This work may be the thesis material for the M. S. degree, or may be carried out for graduate credit apart from the thesis. Two to five credits. Fall, Winter, Spring. Time arranged. *Bennett*

240. Animal Nutrition Research. The same as for A.H. 230, except that research will be some phase of animal nutrition. Two to five credits. Fall, Winter, Spring. Time arranged. *L. L. Madsen and Harris*

250. Animal Production Research. The same as A. H. 230, except that research will be in some phase of animal production aside from breeding or nutritional problems. Two to five credits. Fall, Wnter, Spring. Time arranged. *Staff*

260, 261, 262. Animal Industry Seminar. Topics of current interest and research problems are presented by graduate students, staff members and guest speakers. Subject matter of discussions relate to nutrition, breeding, and production during Fall, Winter and Spring, respectively. One credit (may be repeated). Fall, Winter, Spring. Th. 11. *Staff*

Bacteriology and Public Health

Administered jointly by the School of Agriculture and the School of Arts and Sciences

J. E. GREAVES, *Professor Emeritus;* W. W. SMITH, W. B. PRESTON, *Professors;* K. R. STEVENS, *Associate Professor;* L. W. JONES, W. R. SCHOLES, *Assistant Professors;* ANN BURNS, M. B. LASER, D. W. WILL, *Instructors.*

BACHELOR OF SCIENCE DEGREES IN BACTERIOLOGY AND PUBLIC HEALTH

To qualify for the Bacteriology major in Specialized Agriculture (see page 68) students should take: Bacteriology 5, 70 or 1 plus 71, 100, 104, 105, 107, 120, 160, 180, Botany 21, 22, Chemistry 10, 11, 12 90, Mathematics 34 or 35, Physiology 4, 10, Zoology 2, Physics 6 and 7.

To qualify for the Bacteriology major in the Technical course (see page 70) in Agriculture students should take Bacteriology 5, 70 or 1 plus 71, 100, 101, 104, 105, 120, 160, 170, 180, 191, 192, 193, Botany 21, 22, 23, 130, 150, Chemistry 3, 4, 5, 101 or 102, 121, 122, 191, Mathematics 35, 46, Physics 21, 22, Zoology 3, 4, and 116.

See pages 47 and 48 for courses that may satisfy group requirements.

MASTER OF SCIENCE DEGREE IN BACTERIOLOGY

The Bacteriology and Public Health Department offers opportunity for research and graduate study leading to a Master of Science Degree in the various specialized fields: the research and graduate possibilities in these various field are greatly augmented through the cooperation of the United States Department of Agriculture.

The following courses of the 100 series may be used for graduate credit by students majoring in the Department of Bacteriology: 100, 101, 120, 144, 163, 166, 170, and 180.

For graduate students in other departments the following courses in the 100 series may be modified and used for graduate credit: 100, 104, 120, 140, 144, 160, 163, 166, 170, and 180.

Courses numbered over 200 are largely restricted to graduate students.

1. Elementary Bacteriology. Biology and significance of bacteria and other microorganisms; their morphology and physiology; fundamental principles governing the bacteriology of water, sewage, milk, food sanitation, communicable diseases, etc. Where possible this course should be accompanied by Bacteriology 3. Four credits. Fall and Spring, M. T. W. Th. 8, 10, and 1. Winter, M. T. W. Th. 8, 10, 1 and 2. *Greaves, Stevens*

3. Bacteriological Demonstrations. A demonstration of the more important experiments, principles, and fundamentals of Elementary Bacteriology. One one-hour laboratory demonstration. Prerequisite: Concurrent or previous registration in 1. One credit. Fall and Spring, F. 8, 10, and 1. Winter, F. 8, 10, 1 and 2. *Stevens, Laser*

5. Elementary Public Health. Function and organization of Health Departments. Transmission, prevention, and control of communicable diseases. Public Health relation to non-communicable diseases. Three credits. Fall, M. W. F. 8 and 9, Winter, M. W. F. 9 and 10, Spring, M. W. F. 9. *Jones, Scholes, Smith*

15. Health problems of the College Student. Two credits. Spring, T. Th. 9. *Scholes*

70. General Bacteriology. Fundamental principles of the nature, growth and survival of microbes. Practical applications of bacteriology. The methods of bacteriology. Recommended for majors in science departments. Prerequisite: one year of college chemistry. Five credits. Three lectures and two labs. Fall, M. W. F. 11, M. W. 2-5, Winter, M. W. F. 11, T. Th. 2-5. *Jones, Laser*

71. Fundamental Bacteriology Laboratory. The general bacteriology laboratory for those students who wish to substitute Bacteriology 1 plus 71 for 70. Prerequisite: previous or concurrent registration in Bacteriology 1. Two labs. Two credits. Fall, M. W. 2-5, Winter, T. Th. 2-5. *Laser*

90. History of Bacteriology. The men and discoveries that lead to modern bacteriology. Prerequisite: 1 or 70. Two credits. Winter, T. Th. 9. *Smith*

100. Soil Bacteriology. The relationship of bacteria to processes of soil fertility, including organic matter decomposition. Prerequisites: 1 or 70, Chem. 12 or 122. Three credits. (Not offered 1947-48.) *Stevens*

101. Soil Bacteriology Laboratory. Experiments to demonstrate the fundamentals discussed in the lecture course. Prerequisite: Previous or concurrent registration in 100. Two credits. (Not offered 1947-48.) *Stevens*

104. Dairy Bacteriology. The microorganisms of milk and dairy products and their relation to the production, spoilage, and sanitation of such products. Prerequisite: Bacteriology 1, or 70. Three credits. Spring, M. W. F. 9. *Jones*

105. Dairy Bacteriology Laboratory. Experiements to demonstrate the fundamentals discussed in the lecture course. Two three-hour laboratory periods. Prerequisite: 70 or 71. Two credits. Spring, T. Th. 2-5. *Jones*

107. Systematic and Determinative Bacteriology. The isolation, identification, and classification of bacteria. Prerequisite: 70 or 71. One lecture and two labs. Three credits. Spring, F. 2, M. W. 2-5. *Stevens*

120. Food Microbiology. The microorganisms involved in food production, processing, preservation, and spoilage. Prerequisites: 70 or 71, Chem. 12 or 122. Three lectures and two labs. Five credits. Fall, M. W. F. 8, T. Th. 2-5. *Stevens*

130. Clinical Laboratory Methods. Discussion and practical experience in the laboratory methods used in the diagnosis of disease. Prerequisites: 70 or 71, Chem. 12 or 121. Five credits. Spring, T. Th. 9, T. Th. 2-5, 3 hours arranged. *Will*

131, 132, 133. Advanced Clinical Laboratory Methods. Open to qualified students only. Five credits each quarter. Fall, Winter, and Spring, W. 12, plus 12 hours arranged. *Will*

140. Standard Methods of Water Analysis. The techniques and significance of the standard tests of water and sewage. Prerequisites: 70 or 71, Chem. 12 or 122. Three credits. Winter, F. 2, M. W. 2-5. *Jones*

144. Sanitation and Public Health. The control of the environment; public health administration. Prerequisite: 70 or 71. Three credits. Spring, M. W. F. 11. *Scholes*

151. Community Health. The organization and functioning of official and non-official health agencies in the fields of maternal, infant, preschool, school and adult hygience in the light of modern trends and present social needs. Local health problems, especially rural problems, will be analyzed. Prerequisite: Bacteriology 5. Three credits. Winter, M. W. F. 9. *Scholes*

155. School Health. The practical needs in health and health training in the school. Methods and materials in health training and instruction. (Meets state certification requirements in health education.) Three credits. Fall and Winter, M. W. F. 12, Spring, M. W. F. 8 and 12. *Scholes*

160. Pathogenic Bacteriology. The properties and characteristics of pathogenic microorganisms and their relation to the cause, prevention, and control of infectious diseases. Prerequisites: 70 and 71. Three lectures and two three-hour lab periods. Winter, M. W. F. 11, T. Th. 2-5. *Smith*

163. Serological Methods. The use of antigen-antibody reaction in the diagnosis of disease and in the identification of bacteria. Prerequisite: 70 or 71. Three credits. Fall, Sat. 8-12, F. 2-5. *Will*

166. Immunology. A study of immunity. Prerequisite: 70 or 71. Two credits. Spring, T. Th. 1. *Greaves*

170. Industrial Bacteriology. The role of microorganisms in industrial fermentations. Prerequisite: 70 or 71. Chem. 12 or 122. Three credits. Winter, M. W. F. 9. *Jones*

180. Metabolism of Bacteria. Composition of and transformations due to microorganisms. Prerequisites: 70 or 71, Chem. 12 or 122. Three credits. Fall, M. W. F. 9. *Jones*

191, 192, 193. Proseminar. Prerequisites: 70 or 71, senior status and approval by the department head. One credit each quarter. Fall, Winter and Spring, Th. 11. *Staff*

197, 198, 199. Bacteriological Problems. Closely supervised library or laboratory study in a selected problem in bacteriology. Prerequisite: 70 or 71, plus one upper division course in Bacteriology. Two credits each quarter. Fall, Winter and Spring, Th. 12 and five hours arranged. *Staff*

200. Problems in Soil Microbiology. Special assignments, reports and discussions. Review of literature in various phases of soil microbiology, and preparation of a comprehensive and critical review of at least one phase of the subject. Two to five credits. Spring, time arranged. *Stevens*

220. Problems in Food Microbiology. Special assignments, reports and discussions. Review of literature in various phases of food microbiology, and preparation of a comprehensive and critical review of at least one phase of the subject. Two to five credits. Fall, time arranged. *Stevens, Smith*

260. Problems in Pathogenic Bacteriology. Special assignments, reports and discussions. Review of literature in various phases of pathogenic bacteriology, and preparation of a comprehensive and critical review of at least one phase of the subject. Two to five credits. Winter, time arranged. *Smith*

263. Problems in Serology. Special assignments, reports and discussions. Review of literature in various phases of serology, and preparation of a comprehensive and critical review of at least one phase of the subject. Two to five credits. Fall, time arranged. *Smith*

270. Problems in Industrial Bacteriology. Special assignments, reports and discussions. Review of literature in various phases of industrial bacteriology, and preparation of a comprehensive and critical review of at least one phase of the subject. Two to five credits. Winter, time arranged. *Jones*

280. Problems in Metabolism of Bacteria. Special assignments, reports and discussions. Review of literature in various phases of metabolism of bacteria, and preparation of a comprehensive and critical review of at least one phase of the subject. Two to five credits. Fall, time arranged. *Jones, Smith*

287, 288, 289. Advanced Bacteriological Problems. Special assignments, reports, and discussions. Review of literature in various phases of bacteriology, and preparation of a comprehensive and critical review. Two to five credits. Fall, Winter and Spring, Th. 12 and five hours arranged. *Staff*

291, 292, 293. Seminar. Prerequisite: graduate status and approval of department head. One credit each quarter. Fall, Winter and Spring, Th. 11. *Staff*

299. Research. The laboratories are well equipped and library facilities adequate for advanced students in bacteriological investigations in agriculture, household science, foods, industries, sanitary science, and veterinary science. One to five credits. Fall, Winter, Spring, time arranged. *Staff*

Biochemistry—See Chemistry 190-197.

Microbiological Assay—See Chemistry 194.

Protozoology—See Zoology 114.

Parasitology—See Zoology 116.

Botany and Plant Pathology

Administered jointly by the School of Agriculture and the School of Arts and Sciences

B. L. RICHARDS, F. B. WANN, *Professors;* E. L. WALDEE, *Associate Professor;* W. S. BOYLE, *Assistant Professor;* ARTHUR H. HOLMGREN, *Assistant Professor and Curator of the Inter-mountain Herbarium;* R. A. BUSH, *Instructor;* BASSETT MAGUIRE, *Curator New York Botanical Garden, Non-Resident Professor;* H. L. BLOOD, *Collaborator, U. S. Department of Agriculture.*

See pages 99 and 100 for course requirements for Bachelor of Science and Master of Science degrees.

1. Principles of Biology. A fundamental course in the basic life principles as illustrated in both plant and animal forms. Special attention will be given to the nature and structure of protoplasm, differentiation in plant and animal cells, adaptation, development and reproduction, heredity and evolution, types and phylogenetic relationships as exhibited in the big groups of plants and animals. For junior college students except those who may elect Botany 21, 22, 23 or Zoology 3 and 4. Five credits. Fall, Section 1, Daily 9. *Staff in Botany*

21, 22, 23. General Botany. An introduction to the structure, physiology, reproduction and evolution of plant life. Continuous through three quarters. Consideration is given to: the structure, physiology and reproduction of seed bearing plants; comparative study of representatives of the plant kingdom from an evolutionary point of view; study of the major families of vascular plants found in the western states. Three credits each quarter. Fall, Winter and Spring. Two lectures and one laboratory period each week. Lectures: Sec. 1, T. Th. 9; Sec. 2, T. Th. 10. Laboratories: Sec. 1, M. 2-5; Sec. 2, T. 2-5; Sec. 3, W. 2-5; Sec. 4, Th. 2-5; Sec. 5, F. 9-12. *Boyle*

30. Taxonomy of Vascular Plants. The kinds, relationships, and classifications of the vascular plants chiefly of this region. Prerequisites: Botany 21, 22, 23. Five credits. Spring. Lect. T. Th. 9; Lab., M. W. 2-5 or T. Th. 2-5. *Holmgren*

104. Taxonomy of Poisonous Plants. Deals with the recognition, distribution, and ecology of poisonous plants, native and introduced, which occur in the intermountain West, with particular emphasis upon those found in Utah. Prerequisite: Botany 30. Two credits. Winter. Lect., M. 10; Lab., M. 2-5. *Holmgren*

108. Agrostology. A taxonomic study of native and imported grasses of the western ranges. Special attention given to species playing an important part in grazing and soil binding. Prerequisites: Botany 21, 22, 23, 30. Four credits. Winter, Lect., M. W. 11; Lab., T. Th. 2-5. *Holmgren*

112. Aquatic and Marsh Plants. A taxonomic and ecological study of aquatic and marsh plants with special emphasis on important food and cover plants for wildlife. Prerequisites: Botany 21, 22, 23, 30. Three credits. Fall, Lect., M. 10; Lab., M. Th. 2-5. *Holmgren*

116. Micro-Technique. Principles and methods in the preparation of plant materials for microscopic study. Prerequisites: Botany 21, 22, 23. Four credits. Winter. Lect., M. W. 1; Lab., M. W. 2-5. *Boyle*

117. Anatomy. Structure and development of major cell types and tissues; comparative anatomy of the stem, root and leaf of seed bearing plants. Prerequisites: Botany 21, 22, 23. Four credits. Spring. Lect., M. W. 1; Lab., M. W. 2-5. (Not given 1947-48.) *Boyle*

118. Cytology. A detailed study of the cell with particular emphasis on the structure and behavior of the chromosomes and their bearing on genetics, reproduction and evolution. Prerequisites: A year's course in Botany or Zoology and preferably Botany 116. Four credits. Spring. Lect., M. W. 1; Lab., M. W. 2-5. *Boyle*

120. Elementary Plant Physiology. Fundamental principles of absorption, mineral nutrition, food manufacture, metabolism, translocation, and growth. Prerequisites: Botany 21, 22, 23, and Chemistry 12 or 121. Five credits. Winter, M. W. F. 9; Lab., T. Th. 8-11. Spring M. W. F. 9; Lab. T. Th. 2-5. *Wann*

121. Water Relations of Native Plants. Consideration of rooting habits, sap concentration, transpiration and water requirements of native plants in relation to distribution and adaptation to environment. Prerequisite: Botany 120. Three credits. Winter, M. W. F. 11. *Wann*

130. Principles of Plant Pathology. Fundamental principles underlying diseases in plants. The types of diseases and methods of study are such as will give the student a comprehensive view of the subject of Plant Pathology. Prerequisites: Botany 21, 22, 23. Five credits. Fall, Lect., M. W. F. 11; Lab., M. F. 2-5. *Richards*

131. Field and Forage Crop Diseases. Diseases of field and forage crops with special emphasis on the factors underlying their cause, development, and control. Prerequisite: Botany 130. Four credits. Winter, Alternates with Botany 135. Lect., M. W. 11; Lab., T. Th. 2-5. *Rickards and Waldee*

135. Vegetable and Fruit Crop Diseases. Diseases of vegetable and fruit crops. Prerequisite, Botany 130. To alternate with Botany 131. Four credits. Winter, Lect., W. F. 11; Lab., M. F. 2-5. (Not given 1947-48.) *Richards and Waldee*

140. Forest Pathology. Study of the nature, cause and control of diseases affecting forest trees. Factors inducing loss in forest products are also emphasized. Prerequisites: Botany 21, 22 and 23. Four credits. Winter, Lect., W. F. 10; Lab., T. 8-11, Th. 9-12. *Waldee*

150. Mycology. Morphology and taxonomy of the Phycomycetes and Ascomycetes with emphasis on economic forms. Prerequisites: Botany 21, 22, 23. Four credits. Fall. Alternates with Botany 151. Arranged. *Richards and Waldee*

151. Mycology. Continuation of Botany 150, dealing with the morphology and taxonomy of the Basidiomycetes and Fungi imperfecti. Prerequisites: Botany 21, 22, 23. Four credits. Fall. (Not given 1947-48.) *Richards and Waldee*

160, 161, 162. Laboratory Methods. Open to qualified senior and graduate students majoring in Botany. One credit each quarter. Fall, Winter, Spring. Time arranged. Graduate credit may be obtained by registering for 260, 261, 262. *Staff*

221. Pathological Technique. Special methods as applied to Plant Pathology, Physiology, and related subjects. Students may register for this course only by special permission. Four credits. Time arranged. Winter. *Staff*

224. Advanced Plant Physiology. Chemical reactions and transformations underlying the vital processes in plants. Prerequisite: Botany 120. Three credits. Spring, M. W. F. 11. *Wann*

228. Advanced Plant Pathology. Fundamental principles underlying plant disease control practices. Four credits. Prerequisite: Botany 130 and 150 or equivalent. Time arranged. *Staff*

234, 235, 236. Special Problems. Open to qualified students majoring in Pathology, Taxonomy, Plant Physiology, or Cytology. Fall, Winter, Spring. Two to four credits. Time arranged. *Staff*

240, 241, 242. Seminar. Any quarter. Two credits. Time arranged. *Staff*

250, 251, 252. Research. Open to all qualified college students in Botany and Plant Pathology. Any quarter. Time and credit arranged. *Staff*

Plant Ecology. (See Range Management 126.)

Prin. of Genetics. (See Zoology 112.)

Dairy Industry

G. B. CAINE, A. J. MORRIS, *Professors;* G. Q. BATEMAN, *Associate Professor;*
LYMAN RICH, *Assistant Professor, Extension Dairyman;*
J. E. PACKER, *Research Assistant.*

Students majoring in Dairy Husbandry must complete the following major courses for graduation: Dairy 1, 5 and 6; An. Hus. 10, 150, 155, and all other courses listed in Dairy Production. Chem. 107 and Bact. 104 are also required.

A suggested course is set up for students majoring in Dairy Manufacturing. Students should study this course carefully and adhere to it as closely as possible. It is expected that students spend at least six months in a commercial dairy manufacturing establishment before graduation. It is strongly recommended that more than six months be spent in dairies if possible. This can usually be arranged by procuring summer work through the department. Good cooperation exists between the department and commercial dairies, and frequent trips are made to them during this course.

There is a good demand in the technical field of dairying for students who have had advanced training.

An opportunity is offered to do graduate work with an application in the field of chemistry, biochemistry, genetics, bacteriology or economics.

1. General Dairy Husbandry. Designed for students who desire a short general course in Dairy Husbandry. Taught for the students majoring in Dairy

Husbandry as well as any student in the School of Agriculture. The following topics will be considered: History and present status of the dairy industry; starting dairy herds; breeds of dairy cattle; cow testing associations; club work; study of herd records; calf feeding; general principles of feeding, management and housing of dairy cattle. Lab., Judging dairy cattle. Three credits. Fall, Winter, Spring, T. Th. 9; Lab., Th. 2-5. *Caine*

3. Principles of Dairy Industry. A general course introductory to all courses in Dairy Manufacturing and adapted to students taking general agricultural work. It includes the history and development of the dairy industry with definite study of the secretion of milk, the use and operation of Babcock tests; and a brief study of butter, cheese, ice cream, and of dairy arithmetic. Three credits. Winter, T. Th. 10; Lab., W. 2-5. *Morris*

5. Judging Dairy Products. Methods and practice in judging and grading dairy products for market and show. Two credits. Spring, W. 1; Lab., W. 2-5. *Morris*

6. Market Milk. Modern, sanitary methods of producing, processing, and marketing milk, cream, and related products for city supply. Five credits. Fall, M. T. W. Th. 8; Lab., T. 2-5. *Morris*

7. **Dairy Practice.** A course for special or short course students only. Practice in plant manufacture will be emphasized. Any quarter. Time and credit arranged. *Morris*

12. Breeds of Dairy Cattle. Study of history and development of all breeds of dairy cattle; special emphasis on the various families within the breeds; requirements for official testing; pedigree and herd book study. Four credits. Fall, M. W. F. 9; Lab., 2-5. (Not given 1947-48.) *Caine*

101. Manufacture of Ice Cream and Ices. Purchase of raw materials. Chemical and physical structure of an ice cream mix and its relation to the finished product. Standardizing, processing, and freezing of standard commercial ice cream, sherbets, and ices. Problems in merchandising and selling included. Five credits. Spring, M. T. W. Th. 10; Lab., T 2-5. *Morris*

102. Manufacture of Butter. Receiving and grading of milk and cream. Neutralization and pasteurization of cream. Manufacture, packing, and grading of butter under commercial conditions. Quality and composition control will be emphasized. Five credits. Winter, M. T. W. Th. 8; Lab., T. 2-5. *Morris*

103. Manufacture of Cheese. A study of the factors involved in the manufacture of cheese of the cheddar and other types. Classification, statistics, curing, marketing, and factory organization will also be studied. Five credits. Fall, M. W. F. 10; Lab., F. 11-5. *Morris*

105, 106, 107. Management and Operation of Dairy Manufacturing Plants. Personnel problems, advertising, selling, managerial use of records, and other principles underlying successful management and operation are considered. All operations of the creamery are conducted by this class. Application for admittance must be made in writing. Two credits each quarter. W. 1; Spring, M. 1; Lab., arranged. *Morris*

109. Dairy Production. A brief review of the dairy industry. The place of dairying in a permanent system of Agriculture. Origin of breeds, study of dairy type, brief review of breeds of dairy cattle. Factors to consider in selecting a breed. Selection of cows, systems of record keeping, selection, care, and management of the herd sire. Winter, three credits. M. W. F. 11. *Caine and Rich*

110. Dairy Production. A brief review of dairy cattle breeding, calf feeding and management, developing dairy heifers, factors influencing the growth and development of dairy cattle, the care and management of dairy herds. Special emphasis on feeding for milk production. A brief study of metabolism and the characteristics of feeds and feeding standards. A thorough study of housing dairy cattle. Prerequisite, Dairy 109. Five credits. Spring, M. W. Th. F. 11; Lab., T. 2-5. *Caine and Bateman*

111. Dairy Cattle Judging. A study of the types of the various breeds of dairy cattle. Visits to important herds. Valuation of dairy cattle. Two credits. Spring, T. Th. 2-5. *Caine*

115. Seminar. Discussion and reports of current literature. Any quarter. Time and credit arranged. *Staff*

150. Special Problems in Dairy Production. Any quarter. Time and credit arranged. *Caine*

154. Special Problems in Dairy Manufacturing. Any quarter. Time and credit arranged. *Morris*

216. Research in Dairy Production. Any quarter. Time and credit arranged. *Caine*

217. Research in Dairy Manufacturing. Any quarter. Time and credit arranged. (Twelve credits, maximum.) *Morris*

254. Special Problems in Dairy Manufacturing. Any quarter. Time and credit arranged. *Morris*

260, 261, 262. Animal Industry Seminar. Research and current topics of special interest to Dairy Production students. Subjects relating to nutrition, breeding, and production. One credit per quarter. Fall, Winter, Spring, Th. 11. *Staff*

Horticulture

F. M. COE, *Associate Professor;* R. K. GERBER, *Assistant Professor;* CLARENCE D. ASHTON, *Extension Horticulturalist;* ODEAL KIRK, *Superintendent, Ogden Substation.*

The instructional work in horticulture provides not only for the needs of the student who wishes to specialize in this field of service, but offers general introductory and service courses to students specializing in other fields of agriculture. Theoretical instruction in horticultural science is accompanied by practical work with the actual trees, fruits, vines and plants. Practice in identification of varieties, pruning, grafting, budding and other methods of propagation, spraying, planting, pollination and hybridizing of fruit plants, grading, and packing of fruits is given in laboratory exercises which are carried out in greenhouses, nurseries, gardens, packing houses, vineyards, berry plantations and orchards of the College and Experiment Station as well as in laboratories. Campus facilities are supplemented by field trips to private orchards, nurseries and berry farms in central and northern Utah.

All courses in horticulture are open to veterans to prepare them for opportunities in fruit growing, nursery work and related fields, and special attention will be given to their needs. If 10 or more such students apply, special vocational courses covering the practical and commercial phases of fruit growing will be given.

Students specializing in horticulture may elect to major in general horticulture or in the more specialized field of pomology. Basic training in botany, plant pathology, chemistry, physics, entomology, soils, irrigation, agricultural economics, genetics, English and speech should precede or accompany course work for a major or minor in horticulture. Students should elect advanced work in soils, plant breeding, botany and entomology.

Professional courses of study with a major in horticulture may be followed, leading to commercial fruit growing and marketing, Smith-Hughes teaching, agricultural inspection, and extension work. An approved scientific course is also offered leading to graduate study in preparation for technical research and collegiate instruction.

For a major in horticulture, the following courses are required: Hort. 1, 6, 8, 101, 102, 107, 110, 112, 151, 152, 154, 155; Vegetable Crops 1, 105; Landscape Architecture 3. Supporting courses recommended are: Ent. 108, 109; Zool. 112; Botany 23, 30, 120, 130, 135; Agron. 56, 107, 109, 115; Ag. Econ. 62, 113, 114; A. E. 10, 14a, 15a, 106, 116.

1. General Horticulture. An informational course in general horticulure. Tree fruits and small fruits are considered under the following headings: out-

look, selection of locations and varieties, propagation and rootstocks, establishing the enterprise, pruning and training, soil management, thinning, pollination, pest control, harvesting, grading and packing. Three credits. Fall, Winter, Spring. M. W. F. 11. *Staff*

2. General Horticulture Laboratory. A laboratory course to accompany or follow Horticulture 1. A prerequisite for advanced horticultural courses. Practical experience in the various operations of horticultural work in season. One credit. Fall, T. 2-5; Spring, W. 2-5. *Staff*

6. Plant Propagation. The fundamental principles underlying the propagation of plants: seedage, graftage, cuttage, layerage, separation, and division. Practice is taught in laboratory exercises in the greenhouse and nursery. Designed for anyone interested in plant science or plants as a hobby. Three credits. Spring, T. Th. 11; Lab., T. 2-5. *Staff*

8. Small Fruit Production. Commercial and home culture of strawberries, blackberries, dewberries, raspberries, gooseberries, currants, and grapes, including (a) location; (b) soil management; (c) botany, varieties, classification; (d) propagation, planting, and culture; (e) pruning and training; (f) harvesting and marketing. Three credits. Winter. M. W. F. 1. *Staff*

101, 102. Advanced Pomology. A two-term course covering the fundamental principles and practices of orcharding as developed by research in horticultural science. Course 101 includes geography of fruit production, climatic factors, temperature relations, propagation, rootstocks, and water relations; course 102 covers nutrition, pruning and training, fruit setting, thinning, soil management. The practical application of fundamental principles is considered. Courses 110, 111, 112 (Orchard Practice) are laboratories for these courses, and should accompany them. Prerequisites: Botany 23; Chem. 12 or 121; Agronomy 56. Three credits each quarter. Fall and Winter. Time arranged. *Staff*

107. Spraying. Fungicides and insecticides used in the control of insects and diseases; preparation, properties, and use in spraying; spray machinery and equipment, dusts, and dusting; spray schedules, economics of spraying; fumigation; design, care and operation of spray equipment. Prerequisites: Chem. 4 or 11; Botany 130 (Plant Pathology); and Zoology 108 (Agr. Entomology). Three credits. Winter. Time arranged. *Staff*

110, 111, 112. Orchard Practice. Laboratory course to accompany, 101, 102, 152. Advanced field work in seasonal orchard operations. Fall quarter includes picking, grading, packing and storage of fruits, exhibiting and judging, and field trips to orchards, packing plants and storages. Winter quarter includes practice in bench grafting, seed sterilization, stratification, handling seedlings, pruning, training, grafting, orchard planning, spraying and packing house machinery care and adjustment. Spring operations are pruning, renovation, grafting, planting, pollination, hybridizing, spraying, cultivation, irrigation, and thinning. Prerequisite, Hort. 1. One credit each quarter. Time arranged. *Staff*

151. Systematic Pomology. Study of varieties of fruits, origin, classification, identification, judging, adaptation, important pomological groups and their relationships. Prerequisite, Hort. 1. Alternates with 101. Four credits. Fall. (Not given 1947-48.) *Coe*

152. Commercial Pomology. Problems in handling and marketing of fruits; maturity indexes, picking, grading, packing, transportation, storage, distribution, buildings, equipment, roadside and local marketing. Hort. 110 should precede this course. Prerequisite, Hort. 1. Alternates with 102. Three credits. Winter. (Not given 1947-48.) *Staff*

153, 154, 155. Seminar. Oral and written reports on research work and original papers on pomological problems such as fruit breeding, storage, fruitfulness, pollination, water relations, hardiness, etc. One credit each quarter. Fall, Winter, and Spring. Time arranged. *Staff*

156. Special Problems. Advanced problems in pomology for qualified seniors or graduate students. Assigned readings and research work in library, laboratory, greenhouse or field, presented as term papers. Registration by permission only. Any quarter. One to three hours' credit. Time and credit arranged. *Staff*

201, 202, 203, 204-A, 204-B. Research. Original research on pomological problems for graduate students taking a major or minor in horticulture. Registration by permission only. Three to ten credits. Course 201, Fall quarter; 201, Winter quarter; 203, Spring quarter, 204-A and 204-B, Summer session and intersession, respectively. *Staff*

Landscape Architecture and Planning

Administered jointly by the School of Agriculture and the School of Arts and Sciences

LAVAL S. MORRIS, *Professor;* KENJI SHIOZAWA, *Assistant.*

The Department of Landscape Architecture and Planning is concerned with the design and development of land areas for use in relation to man's needs. Land use is of prime importance in the evolution of a plan or design, and constant endeavor is made to turn out work which is functional.

Communities and regions are studied as social and physical organisms. These organisms are analyzed, observed and put together piece by piece. The residential area or subdivision is studied even more intensively than the individual home, lots and their relation to each other is emphasized. The business and industrial areas, the recreational facilites including parks, circulation and car parking space, airports, cemeteries, civic groups and a great variety of public and private areas are studied in relation to people and their needs.

The most intensive training required in landscape architecture and planning is in design. It is a discipline requiring considerable time and restrained imagination. This type of creative work is neither taught nor learned in the same way most subjects are handled. Plato says of it, ". . . but, after much communing and constant intercourse with the thing itself, suddenly, like a flame kindled from a running fire, it is born into the soul, and hence-forth nourishes itself." When that time arrives in the life of the student design and intellectual pleasure are as one with each other.

Students spending their first year at a junior college, or other institution, should take among other things, mathematics through trigonometry, freshman English, sociology and art.

Freshman Year

	Credit
Algebra, Math. 34, 35	8
Trigonometry, Math. 46	5
General Botany, Botany 21, 22	6
Inorganic Chemistry Chemistry 1 or 10	5
Mechanics of Writing, English 2	3
Elementary Design and Form Study, Art 1	3
Elements of Landscape Architecture, L. A. 3	3
Drawing, L. A. 20	3
Hist. and Lit. Landscape Architecture, L. A. 30	5
Electives	9
	50

Sophomore Year

	Credit
Mechanics and Molecular Physics Physics 20	5
Plane Surveying Civil Engineering 81, 83	8
Mapping and Office Practice Civil Engineering 82	3
Sophomore Composition English 10	5
Sociology 70	5
Soils Agronomy 56	4
Plant Propagation Horticulture 6	3
Plant Materials L. A. 10, 11	6
Architectural Design L. A. 60, 61, 62	6
Creative Expression Art 104	3
	48

Junior Year

	Credit
Advanced Composition English 110	5
Economics 51	5
Descriptive Geometry Civil Engineering 63	3
Principles of Genetics Zoology 112	5
Geology 3	5
Design L. A. 140, 141, 142	6
Landscape Construction L. A. 160, 161, 162	9
Fundamentals of Speech Speech 1	5
Creative Expression, Art 104	3
Planting Design, L. A. 150	2
Electives	2
	50

Senior Year

	Credit
The Writing of Feature Articles Journalism 112	3
Roads and Pavements Civil Engineering 120	4
Organic Evolution Zoology 131	3
Community Organization Sociology 140	3
Planting Design L. A. 151, 152	6
Advanced Planning and Design L. A. 180, 181, 182	9
Building Construction 161	5
Creative Expression	6
Electives	13
	50

3. Elements of Landscape Architecture and Planning. Relation of people to land; regions and small areas. Principles of design and composition as applied to various types of land planning. The design of home grounds emphasized. Particular value to those wanting a general knowledge of landscape architecture. A field trip required. Three credits. Fall and Spring. Lect. T. Th. 8; Lab., T. or Th. 2-5. *Morris*

20. Drawing. A general course in drawing to acquaint the student with the use of instruments. Necessary to all courses in design. Lettering, general drafting, perspective drawing, light and shade studied. Three credits. Fall and Winter. M. W. F. 2-5. *Shiozawa*

30. History and Literature of Landscape Architecture. The history of landscape architecture from antiquity to the present time, its relation to architecture and other allied arts. Characteristics of landscape styles in the various countries in relation to present day design. Five credits. Winter, Daily 9. *Morris*

40, 41. Plant Materials. Classification, identification, ecological requirements and uses of woody and herbaceous plants for landscape purposes. Both native and introduced plants studied. Three credits each quarter. Fall and Spring. Lect., T. Th. 9; Lab., Th. 2-5. *Staff*

60, 61, 62. Architectural Design. The study and design of architectural structures. Relation of buildings to the land. Integration of roofed and open areas. Two credits each quarter. Fall, Winter, Spring. T. Th. 2-5. *Staff*

130. Recreational Planning. Public and private recreation in relation to design, construction and operation. National and state parks and forests studied as they pertain to recreation. Field trip required. Two credits. Spring, T. Th. 9. *Staff*

135. Travel Course. A major field trip to examine a variety of projects in planning and design. Students are required to take this course at least twice during their training. Time and credit arranged. *Morris*

140, 141, 142. Design. The design of private and public properties based on the principles of utility and composition. Prerequisites: Landscape Architecture 3 and 20; and Civil Engineering 81, 82, and 83. Two credits. Fall, Winter, and Spring, T. Th. 2-5. *Morris*

150, 151, 152. Planting Design. Pictorial compositions and planting plans developed together. This course is designed to develop the student's ability to visualize the finished landscape. Two credits each quarter. Fall, Winter, and Spring, T. Th. 2-5. *Morris*

160, 161, 162. Landscape Construction. Master construction plans, grading, drainage, sprinkling systems, structures, cost estimates. Three credits each quarter. Fall, Winter, Spring, M. W. F. 2-5. *Staff*

170. Town and City Planning. Gathering and analyzing data for town and city planning. Land use and zoning, circulation, recreation, housing. Three credits. Fall, M. W. F. 9. *Staff*

180, 181, 182. Advanced Planning and Design. The design of subdivisions, housing projects, public grounds, parks, cemeteries, building groups, and recreational areas on various types of topography. Three credits each quarter. Fall, Winter, Spring, M. W. F. 2-5. *Morris*

190. Special Problems. Selected problems to meet the needs of individual students for completion of training. Registration by permission only. Any quarter. Time and credit arranged. *Staff*

195. Seminar. Readings and discussions. One credit. Winter, M. 4. *Staff*

210. Advanced Problems in Design and Planning. Time and credit arranged. *Staff*

Poultry Husbandry

BYRON ALDER, CARL FRISCHKNECHT, *Professors;* C. I. DRAPER, *Associate Professor;* LAWRENCE MORRIS, *Extension Specialist.*

The department offers work leading to a Master's Degree in Poultry Husbandry to students qualified to pursue work for this degree.

Credit for the following courses may not be used to meet the requirements for this advanced degree: Poultry Husbandry 101, 102, 104, 127.

1. General Poultry. A study of breeds, judging, incubation, brooding, feeding, marketing, designed to meet the needs of the students wishing a general knowledge of the poultry industry and the problems of production, and a foundation upon which other courses are built. Three credits. Fall or Winter, M. W. F. 11. *Alder and Draper*

2. General Poultry Laboratory. Covers the same work as Poultry 1, with practical laboratory problems. One credit. Fall or Winter, T. 2-5. *Alder and Draper*

8. Turkey Production. A study of the breeds, breeding, brooding, feeding, and marketing of turkeys. Special problems involved in small farm flock or large commercial flock management are emphasized. Three credits. Winter, M. W. F. 9. *Alder*

10. Poultry Practice. Elementary practice at the poultry yards. Prerequisite, Poultry 1. Spring. Time and credit arranged. *Alder and Draper*

101. Poultry Production. A study of poultry production problems, breeds, judging, selection, feeding and management. Poultry Lab. 102 should accompany this course. Three credits. Winter, M. W. F. 8. *Draper*

102. Poultry Production. Laboratory practice in selection, judging, and other production problems. One credit. Winter, W. 2-5. *Draper*

104. Incubation and Brooding. This course is designed to familiarize the student with the special problems involved in incubation or hatchery operation and the brooding, feeding and rearing of chicks. The advantages and disadvantages of battery, hot water, electric, coal burning, and gas brooders are emphasized. Two credits. Spring, T. Th. 9. *Frischknecht*

105. Poultry Management. Problems of location of poultry farm, farm planning, renewing the flock, feeding, disease control, marketing, and other problems affecting labor income are studied in detail. Prerequisite, Poultry 1. Three credits. Spring, M. W. F. 8. Poultry 105 and 106 given alternate years. (Not given 1947-48.) *Frischknecht*

106. Breeds and Breeding. A study of the origin and development of the breeds and varieties of poultry and their adaptability to intermountain conditions; production of hatching eggs for commercial hatcheries; R. O. P. Breeding, and the National Poultry Improvement Plan; and important inheritance problems in poultry. Prerequisites: Poultry 1 or 101, and An. Hus. 15, or Zoo. 112. Three credits. Spring, M. W. F. 8. *Frischknecht*

107. Poultry Feeds and Feeding. A study of nutrition problems, the feeds, and methods of feeding. Developing rations for special needs and home mixing. Prerequisite, Poultry 1. Three credits. Winter, M. W. F. 10. *Draper*

110. Poultry Products. Concerned primarily with the formation, structure, composition, processing, grading, storage, and distribution of poultry and poultry products. Industrial uses and proper care and handling of poultry by-products will also receive some consideration. Three credits. Spring, T. Th. 10. Lab., W. 2-5. *Frischknecht*

125. Special Problems. Special assignment to work out certain information on special problems. Prerequisites: Poultry 1, 104 and 107. Winter and Spring. Time and credit arranged. *Staff*

126. Seminar. Current poultry literature studies; assigned problems and special topics. One credit. Winter. Time arranged. *Staff*

127. Advanced Poultry Practice. Special practice at the poultry yards. Prerequisites: Poultry 1, 104, and 107. Time and credit arranged. Winter, and Spring. *Alder and Draper*

Poultry Diseases. (See Veterinary Science 170.)

210. Research Problems in Poultry Nutrition. Two to five credits. Time and credit arranged. *Staff*

212. Research Problems in Poultry Breeding. Two to five credits. Time and credit arranged. *Staff*

214. Research Problems in Poultry Production. These problems will be in some phase of poultry production other than breeding or nutrition. Two to five credits. Time and credit arranged. *Staff*

260. Animal Industry Seminar, Nutrition. One credit. Fall. Time arranged. *Staff*

261. Animal Industry Seminar, Breeding. One Credit. Winter. Time arranged. *Staff*

262. Animal Industry Seminar, Production. One credit. Spring. Time arranged. *Staff*

Vegetable Crops

L. H. POLLARD, *Professor;* E. MILTON ANDERSEN, *Associate Professor;*
L. R. HAWTHORN, *Collaborator in Research, U. S. D. A.*

Students majoring in Vegetable Crops are required to take the following courses: Vegetable Crops 1, 2, 105, 120, 121, 161, 162, 163; Agronomy 56, 107, 109; Botany 120, 130.

Students who plan to do graduate work may be admitted to the technical course in Vegetable Crops by permission of the Head of the Department and the Dean.

The Department of Vegetable Crops offers work toward a Master of Science Degree in Vegetable Crop Production and Vegetable Breeding. The following courses of the 100 series may be used for graduate credit: 120, 121, 160, 161, 162, 163.

1. Vegetable Production. The methods of production, harvesting, storage, and processing of vegetables. Three credits. Fall, Spring. M. W. F. 10. *Pollard and Andersen*

2. Vegetable Production Laboratory. Designed to give students practical experience in vegetable production. Field trips are taken to important production areas and vegetable processing plants in the state. One credit. Fall, Spring. T. or F. 2-5. *Pollard and Andersen*

105. Major Vegetable Crops. The classification, identification, origin, history, types, and uses of our vegetable crop plants. Special emphasis will be placed on those crops of major importance in Utah. This course alternates with 121. Prerequisite: Veg. Crops 1. Four credits. (Not given 1947-48.) *Pollard and Andersen*

120. Vegetable Improvement. The fundamental principles and practices of plant breeding in the improvement of vegetables. Prerequisite: Agron. 109. Four credits. Spring. M. W. F. 9; Lab., W. 2-5. *Pollard*

121. Advanced Vegetable Crops. A consideration of the economic, ecological and physiological factors underlying vegetable production, based on a study of experimental results. Prerequisites: Veg. Crops 1, 105; Agron. 56; Bot. 120. This course alternates with 105. Four credits. Winter. M. W. F. 10. Lab., F. 2-5. *Andersen*

130. Vegetable and Flower Seed Production. A study of the methods and commercial possibilities of vegetable and flower seed production in Utah. Field trips will be taken to seed producing areas. Three credits. Fall. T. Th. 8. Lab., F. 2-5. (Not given 1947-48.) *Staff*

160. Special Problems. Problems of production and breeding of vegetable crops. Registration by permission only. One to three credits, any quarter. Time arranged. *Staff*

161, 162, 163. Seminar. Reports on research work and presentation of original papers. One credit each quarter. Time arranged. *Staff*

210. Research. Original research on vegetable crop production or breeding problems for graduate students taking a major or minor in vegetable crops. Three to ten credits. Any quarter. Time arranged. *Staff*

Veterinary Science

WAYNE BINNS, M. L. MINER, *Associate Professors;* H. M. NIELSEN, HENDRIK VERSLUIS*, *Assistant Professors.*

Courses in Veterinary Science are designed, not for training specialists in this field, but to complete the instruction of students in Animal Husbandry, Dairy Husbandry, Poultry Husbandry, and Bacteriology. Animal sanitation and disease control are primarily stressed. Pre-veterinary courses for those wishing later to obtain Veterinary degrees elsewhere, may be conveniently taken at this school.

20. Anatomy and Physiology of Domestic Animals. The anatomy and physiology of domestic animals in which the physiology of the digestive and reproductive systems are emphasized. Three credits, Winter and Spring. T. Th. 8. Lab., T. 2-5. *Binns and Staff*

120. Animal Hygiene. The principles and practices necessary to maintain the health of livestock. The causes, descriptions, control, and prevention of the prevalent diseases are also studied. Four credits. Spring, M. W. F. 8; Lab., M. 2-5. *Miner*

170. Poultry Hygiene. The principles and practices necessary to maintain poultry health. The causes, description, control, and prevention of the common diseases affecting poultry in this region. Three credits. Spring, T. Th. 8; Lab., W. 2-5. *Miner*

200. Special Problems. Open to students who are majoring in some related field and who wish to study some particular phase of a disease in animals. Any quarter. Time and credit arranged. *Staff*

210. Research. Outlining and conducting research on animal diseases. Any quarter. Time and credit arranged. *Staff*

* At Branch Veterinary Laboratory, Provo, Utah.

PRE-VETERINARY TRAINING

Students desiring to work toward a degree in Veterinary Medicine (D. V. M.) must have at least one year of pre-veterinary training at some authorized college or university. Most students find it necessary to complete two or more years of college work before they are accepted by a veterinary school. Students majoring in Bacteriology, Zoology, or pre-medics as outlined in this catalog will complete all requirements for entrance into a veterinary college. This college does not give a degree in Veterinary Medicine; therefore, after completing his pre-veterinary work here, the student must continue his training elsewhere. Students from this college, to be accepted, must have a thorough training with a high scholastic standing in the basic subjects required in the pre-veterinary course. Enrollment in veterinary colleges is limited, and students from the state in which the college is located are given preference; therefore, students from this college must be highly qualified to be accepted. A suggested two-year pre-veterinary course follows:

PRE-VETERINARY COURSE

Freshman Year	Sophomore Year
Zoology 3, 4.	Chemistry 3, 4, 5.
Mathematics 34.	Zoology 112.
Animal Husbandry 1.	History 14.
Botany 21, 22.	Dairy 1.
Physics 6, 7.	Sociology 70.
Agricultural Economics 53a, 53b.	English 10.
Animal Husbandry 10.	Speech 1.
Dairy 3.	Soils 56 or Animal Husbandry 150.
Military Science 1, 2, 3.	Poultry Husbandry 1.
	Military Science 4, 5, 6.

Zoology, Entomology and Physiology

Administered jointly by the School of Agriculture and the School of Arts and Sciences

D. M. HAMMOND, G. F. KNOWLTON, C. J. SORENSON, *Professors;* J. SEDLEY STANFORD, G. H. KELKER, CLYDE BIDDULPH, ..., *Associate Professors;* WILLIAM SCHOLES, *Assistant Professor;* MERRILL GUNNELL, *Instructor;* FRANK E. TODD, HOWARD E. DORST, F. V. LIEBERMAN, G. E. BOHART, H. F. THORNLEY, WALTER E. PEAY, S. J. SNOW, WILLIAM P. NYE, *Collaborators in Research, U. S. D. A.*

In addition to course work the Department of Zoology, Entomology and Physiology offers excellent opportunities for research and graduate study in various phases of economic entomology, taxonomy and morphology of insects, and parasitology. Frequently, further training and experience in these fields may be obtained by participation in the work of research projects of the Agricultural Experiment Station.

Requirements for a Major in Agricultural Entomology:

Zoology	3 Invertebrate Zoology	102, 103	Systematic Entomology
	4 Vertebrate Zoology	108	Agricultural Entomology
	112 Principles of Genetics	115	Medical and Veterinary Entomology
	106 Zoological Literature		
	116 Parasitology		
		125, 126	Seminar
Entomology	13 General Entomology	156	Chemistry of Insecticides and Fungicides
	101 Insect Morphology		

See Zoology, Entomology and Physiology, under School of Arts and Sciences, for course descriptions.

SCHOOL OF ARTS AND SCIENCES

CARLTON CULMSEE, *Dean.*

General Information

IN ADDITION to training students to carry on their work in the technical divisions of the Institution, the School of Arts and Sciences offers opportunity to all the students of the College to lay the foundation for a liberal education. The need to understand our own culture as well as the cultures of other nations has never in history been so urgent as now. Such understanding is the surest path to permanent peace in the postwar world. Many of the courses in Arts and Sciences qualify the student directly to play his part as an informed citizen in attempts to realize that great hope. The curricula of Arts and Sciences also enable properly qualified students to major in its departments and thus begin preparation for a career.

The School of Arts and Sciences includes the departments of Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, English and Journalism, Geology, History, Landscape Architecture and Planning, Mathematics, Modern Languages and Latin, Physics, Speech, Zoology, Entomology and Physiology, and Military Science and Tactics.

SUGGESTED COURSES FOR FILLING GROUP REQUIREMENTS

The need of a general education which includes the elements necessary to an understanding of the universe and man's place in it is widely recognized. Below is an attempt to help students satisfy group requirements in such a way that they will not neglect certain subjects regarded as essential in a basic education. Majors in Arts and Sciences departments are urged to fill their groups from the following courses:

1. **Biological Science:**
   - Botany 1 or Zoology 1 (Principles of Biology) ..... 5 credits
   - Bacteriology 1 and 2 or Physiology 4 ..... 5 credits
2. **Exact Science** (at least 10 credits):
   - Chemistry—Any Lower Division course
   - Geology—Any Lower Division course
   - Mathematics—Any Lower Division course
   - Physics—Any Lower Division course
3. **Language and Arts** (at least 10 credits):
   - English—Any Lower Division Literature course
   - Language—Any beginning course in French, German, Portuguese, Spanish, or Latin.
   - Speech—Any Lower Division course
4. **Social Science:**
   - History 4 (World Civilizations) ..... 5 credits
   - Pol. Sci. 1 (Government and the Individual) ..... 5 credits
   - or
   - Pol. Sci. 10 (American National Government) ..... 5 credits

In addition it is urged that students add to their liberal education by electing courses in Art or Landscape Architecture and Planning, Music, Economics, Psychology, and Sociology.

See pages 47 and 48 for general group requirements.

PRE-MEDICAL TRAINING

The School of Arts and Sciences offers the necessary courses to provide a pre-medical training which will satisfy the entrance requirements of Medical Schools of the United States and Canada.

SUGGESTED PRE-MEDICAL SCHEDULE

Freshman Year

(Lower Division)

	F	W	S
Zoology 3, 4	5	5	—
Chem. 3, 4, 5	5	5	5
Math. 34, 35, 46	3	5	5
English 40 or 52	—	—	5
Military Science	1	1	1
Electives	4	2	2
Total	18	18	18

Sophomore Year

(Lower Division)

	F	W	S
German, French or Latin	7	7	—
English 10	—	—	5
Physics 20, 21, 22	5	5	5
Chem. 101, 102	3	3	—
Military Science	1	1	1
Electives	2	2	7
Total	18	18	18

Junior Year

(Upper Division)

	F	W	S
Chem. 121, 122	5	5	—
Zoology 118, 119	—	5	4
English 110	—	—	4
Electives	10	4	10
Total	17	17	17

Recommended electives are Medical Latin and Greek (M. L. 80 and 81), Psychology, Heredity, College Grammar or Technical Writing, History, Political Science and Sociology.

Pre-medical students interested in graduation from this College before attending medical school may major in Chemistry, Physics, Zoology, or other related fields. For the pre-medical major in Zoology, see introduction to Department of Zoology, Entomology and Physiology.

PRE-DENTAL TRAINING

Students planning to go into the profession of Dentistry may take the necessary courses in the School of Arts and Sciences to satisfy the requirements for admission to any of the School of Dentistry in the United States.

SUGGESTED PRE-DENTAL SCHEDULE

Freshman Year

(Lower Division)

	F	W	S
Chemistry 3, 4, 5	5	5	5
Zoology 3, 4	5	5	—
Mathematics 34, 35*, 46*	3	5	5
English 40 or 52	—	—	5
Military Science 1, 2, 3 or P. E.	1	1	1
Electives (optional)	3	2	2
Total	17	18	18

Sophomore Year

(Lower Division)

	F	W	S
Chemistry 121, 122	5	5	—
Physics 21*, 22*, 23*	5	5	5
Zoology 118	—	5	—
English 10, 110	5	—	4
Military Science 4, 5, 6, or P. E.	1	1	1
Electives (optional)	2	2	8
Total	18	18	18

*A number of the Schools of Dentistry require a minimum of only 9 or 10 hours of physics. Students planning to enter one of these schools may take Physics 6 and 7 instead of Physics 21, 22, and 23, and in this case, Mathematics 35 and 46 may be omitted.

Recommended electives are psychology, history, political science, sociology, economics, and English .

Students planning to receive a B. S. degree on a combined curriculum (three years here and one year in a Medical or a Dental school) must fulfill the group and composition and military requirements of this College and must complete a minimum of 141 credits of pre-professional work.

CADET PRE-NURSING TRAINING

Under the Bolton Act, and in cooperation with the Budge Memorial Hospital, the College is offering the fundamental academic courses preparatory to nursing training in the National Cadet Nursing Training program. The academic course covers a period of two quarters and is scheduled as follows:

Fall Quarter

1 and 2	Bacteriology	5 credits	M.W.Th.F. 11, T. 2-5
1a	Introductory Chemistry	5 credits	M.W.F. 10, T.Th. 9-12
40	Sociology for Nurses	3 credits	M.T.Th. 2
4	Physiology	5 credits	daily 9

Winter Quarter

5a	Nutrition for Nurses	5 credits	daily 9
30	Psychology for Nurses	3 credits	M.W.F. 11
10	English	5 credits	daily 10
10	Human Anatomy	5 credits	daily 8

Persons interested in the pre-nursing training program should address inquiries to Professor William Scholes at the College or to the Superintendent of Nursing Training, Budge Memorial Hospital, Logan.

B. S. DEGREE FOR NURSES

Through a joint program offered by Utah State Agricultural College and Budge Memorial Hospital, girls may earn both a Bachelor of Science degree and Registered Nurse credentials in four calendar years of study. Part of the time is spent at the College, part of it at the hospital in Logan, and part at Denver General Hospital. Persons interested in the program should address inquiries to Professor William Scholes at the College or to the Superintendent of Nursing Training, Budge Memorial Hospital, Logan.

Bacteriology and Public Health

Administered jointly by the School of Agriculture and the School of Arts and Sciences

J. E. GREAVES, *Professor Emeritus;* W. W. SMITH, W. B. PRESTON, *Professors;* K. R. STEVENS, *Associate Professor;* L. W. JONES, W. R. SCHOLES, *Assistant Professors;* ANN BURNS, M. B. LASER, D. W. WILL, *Instructors.*

BACHELOR OF SCIENCE DEGREES IN BACTERIOLOGY AND PUBLIC HEALTH

See pages 47 and 48 for courses that may satisfy group requirements.

Students majoring in General Bacteriology should take:

Bacteriology: 70 or 1 plus 71, 100 plus 101 or 170, 104 plus 105 or 120, 107, 160, 180, 191, 192, 193.
Botany: 21, 22.
Chemistry: 190 or 191 plus prerequisites.
Mathematics: 35.
Physics: 22, 23. (6 and 7 will be accepted in special cases.)
Zoology: 3, 4.

Students majoring in Clinical (Medical) Technology should take:

Bacteriology: 5, 70, 107, 130, 131, 132, 133, 160, 163, 166.
Chemistry: 10, 11, 12, 190, 192.
Physiology: 4, 10.
Physics: 6, 7.
Zoology: 3, 4, 114, 116, 117.

See the Department of Bacteriology and Public Health in the School of Agriculture for course listings.

MASTER OF SCIENCE DEGREE IN BACTERIOLOGY

The Bacteriology and Public Health Department offers opportunity for research and graduate study leading to a Master of Science Degree in the various specialized fields. The research and graduate possibilities in these various fields are greatly augmented through the cooperation of the United States Department of Agriculture.

The following courses of the 100 series may be used for graduate credit by students majoring in the Department of Bacteriology: 100, 101, 120, 144, 163, 166, 170, 180.

For graduate students in other departments the following courses in the 100 series may be modified and used for graduate credit: 100, 104, 120, 140, 144, 160, 163, 166, 170, 180.

Courses numbered over 200 are largely restricted to graduate students.

Botany and Plant Pathology

Administered jointly by the School of Agriculture and the School of Arts and Sciences

B. L. RICHARDS, F. B. WANN, *Professors;* E. L. WALDEE, *Associate Professor;* ARTHUR H. HOLMGREN, W. S. BOYLE, *Assistant Professors;* BASSETT MAGUIRE, *Curator New York Botanical Garden, Non-Resident Professor;* H. L. BLOOD, *Collaborator, U. S. D. A.*

BACHELOR OF SCIENCE DEGREE IN BOTANY

Course requirement for a major: 21, 22, 23, 30, 116, 117, 120, 130, 150.

Course requirement for a teaching major: 21, 22, 23, 30, 120, 130.

Recommended additional courses for specialized fields: Pathology, 121, 131, 135, 140, 151. Taxonomy, 104, 108, 112. Physiology, 121. Cytology, 118.

See pages 47 and 48 for courses which may satisfy group requirements.

MASTER OF SCIENCE DEGREE IN BOTANY

The Department of Botany offers opportunity for research and graduate study leading to a Master of Science Degree in the following specialized fields: pathology, taxonomy, physiology and cytology. The research and graduate possibilities in these various fields are greatly augmented through the cooperation of the United States Department of Agriculture and the Inter-Mountain Herbarium.

The following courses of the 100 series may be used for graduate credit by students majoring in the Department of Botany: 104, 118, 121, 151.

The following courses in the 100 series may be modified and used for graduate credit for students in other departments: 104, 117, 118, 120, 121, 130, 150, 151.

See Botany and Plant Pathology in School of Agriculture for course listings.

Chemistry

REUBEN L. HILL, SHERWIN MAESER, DELBERT GREENWOOD, *Professors;*
BRUCE V. WEIDNER, *Associate Professor;* THEODORE M. BURTON,
....., *Assistant Professors.*

The degree of Bachelor of Science in Chemistry is a professional degree and graduates must meet the minimum requirements of the American Chemical Society in addition to fulfilling the group requirements of the College as given on pages 47-48 of this catalog. To aid the student in registering the following suggested schedule is given.

Suggested Schedule

Freshmen

A. For students having completed 1½ units of high school algebra and ½ unit of geometry:

	F	W	S
Chem. 3, 4, 5	5	5	5
Math. 35, 46, 97	5	5	5
Group requirements in biological and/or social Sciences	5	5	5
Physical Education or Military Science and Tactics	1	1	1
	16	16	16

B. For students who enter college with credit for only 1 unit of algebra and ½ unit of geometry:

	F	W	S
Chem. 3, 4, 5	5	5	5
Math. 34, 35, 46	5	5	5
Group requirements in biological and/or social sciences	5	5	—
Eng. 10 or 11 (special petition must be made to take this course in freshman year)	—	—	5
Physical Education or Military Science and Tactics	1	1	1
	16	16	16

Sophomores

A. For students with mathematics:

	F	W	S
Math. 98, 99	5	5	—
English 10 or 11	—	—	5
Physics 20, 21, 22	5	5	5
Chemistry 17, 18, 19	4	4	2
Junior College requirements	3	3	5
Physical Education or Military Science and Tactics	1	1	1
	18	18	18

NOTE: Five credits junior college group requirements must be completed in junior year.

B. For students with incomplete mathematics:			
Math. 97, 98, 99	5	5	5
Physics 20, 21, 22	5	5	5
Chemistry 17, 18, 19	4	4	2
Junior College group requirements	3	3	3
Physical Education or Military Science and Tactics	1	1	1
	18	18	16

Juniors

	F	W	S
Chemistry 121, 122, 123	5	5	5
German	7	7	2
Electives in geology, biology, social science, English lit.	5	5	10
	17	17	17

Seniors

	F	W	S
Chemistry 104, 105, 106	3	3	3
Chemistry 109, 110, 111	1	1	1
Chemistry 135	3	—	—
Chemistry 160	1	1	1
Chemistry 191	—	—	5
English 111	—	4	—
Physicos 120, 121, 130	3	3	3
Electives (must include at least 3 credits adv. chem.)	6	4	5
	17	16	18

MASTER OF SCIENCE DEGREE IN CHEMISTRY

The Chemistry Department offers the Master of Science degree with research in any one of the following fields: Analytical, Biological, Inorganic, Organic, and Physical. In addition to the graduate courses (in the 200 series) the following courses 116, 135, 155, 191 may be used towards the Master's Degree in Chemistry. Any course in the 100 or 200 series may be counted towards the Master's Degree by other departments provided the approval of the committee chairman is obtained.

1. Introductory Chemistry. An informational course in beginning college chemistry designed to give students a broad view of the cultural aspects of the science of chemistry. This is a terminal survey course and cannot be used as a prerequisite for advanced courses in chemistry. Five credits. Fall, Lect., Daily 1. *Staff*

3, 4, 5. Chemical Principles and Qualitative Analysis. An introduction to chemical theory and the principles of chemistry including introductory qualitative analysis in the spring quarter. Prerequisites: high school chemistry or physics, algebra and geometry. This course is designed for science majors, pre-medical and pre-dental students and home economics majors in foods and nutrition. Three lectures and two labs. Five credits each quarter. Fall, Winter, Spring. Lect. Sec. 1, M. W. F. 8; Lab. Sec. 1, T. Th. 2-5; Lab. Sec. 2, M. W. 2-5; Lect. Sec. 2, M. W. F. 11. *Maeser*

10, 11, 12 General Chemistry. An introduction to the fundamental principles of inorganic and organic chemistry. A one-year terminal course open to any matriculated student. Students with a grade of B or better, may enter Chemistry 5 in the spring quarter. Five credits each quarter. Three lectures and two labs. Fall, Winter and Spring. Lectures, Sec. 1, M. W. F. 8; Sec. 2, M. W. F. 10; Sec. 3, T. Th. S. 8; Lab., Sec. 1, M. W. 2-5; Sec. 2, T. Th. 2-5; Sec. 3, T. Th. 8-11 or 9-12. *Staff*

Note: Sec 4 of Chem. 10 will be given in Winter, M. W. F. 9; Lab., M. W. or T. Th. 2-5. Chem. 11, Sec. 3, Spring, M. W. F. 9; Lab., M. W. or T. Th. 2-5. *Staff*

17, 18 or 117, 118. Quantitative Analysis. A course in the theory and practice of gravimetric and volumetric analysis. Prerequisite: Chemistry 5. The course is so designed that it presents a terminal course for majors in agriculture, home economics and pre-medical and pre-dental students. Two lectures and two labs. Four credits each quarter. Fall and Winter. Lectures T. Th. 1. Lab., W. F. 2-5. *Weidner*

19 or 119. Quantitative Analysis. A continuation of Chemistry 18. Required of all chemistry majors. One lecturer and two labs. Three credits. Spring, Lectures, Th. 1. Lab., W. F. 2-5. *Weidner*

104, 105, 106. Physical Chemistry. Including atomic, kinetic, and electron theories, gaseous, liquid and solid state; solutions and thermodynamics. Prerequisites: Physics 20, 21, 22; Chemistry 5; Mathematics 98. Three credits each quarter. Fall, Winter, and Spring. Time arranged. *Staff*

107, 108. Dairy Chemistry. The chemistry of milk and milk products, including tests for adulterants, preservatives, and the routine quantitative methods of the analysis of dairy products. Prerequisites: Chemistry 12 or 122. Winter and Spring quarter, 2 Lect. and 2 Labs. each quarter. Four credits each quarter. Lect., T. Th. 9; Lab., W. F. 2-5. *Hill*

109, 110, 111. Physical Chemistry Laboratory. To accompany Chemistry 104, 105 and 106. One credit each quarter. Fall, Winter and Spring. F. 2-5. *Staff*

116. Inorganic Preparations. A laboratory course in practical laboratory methods of synthetic inorganic chemistry. Prerequisites: Chemistry 5 and 103. Any quarter. Time and credit arranged. *Staff*

120 or 220. Special Courses in Quantitative Analysis. Advanced courses in the analysis of water, food, soil, urine, gas and carbonate and silicate rocks. Prerequisite: Chemistry 9. Winter or Spring. Time and credit arranged. *Weidner*

121, 122. Organic Chemistry. An introductory course in the fundamentals of the chemistry of the carbon compounds. Prerequisites: Chemistry 5 or a grade of B or better in Chemistry 12. Five credits each quarter. Fall and Winter. Three lectures and two labs. Lect., M. W. F. 11; Lab., Sec. 1, M. W. 2-5; Sec. 2, T. 2-5. *Burton*

123. Organic Chemistry. A continuation of Chemistry 122 covering more advanced theories and reactions in organic chemistry. Prerequisite: Chemistry 122. Five credits. Spring. Three lectures and two labs. Lect., M. W. F. 11; Lab., M. W. 2-5. *Burton*

124 or 224. Organic Preparations. An advanced laboratory course in the sythesis of more complex organic compounds. Prerequisite: Chemistry 123. Winter quarter. Time and credit to a maximum of three hours to be arranged. *Burton*

225, 226, 227. Advanced Organic Chemistry. An advanced course designed for senior and graduate students including modern theories and special topics in organic chemistry. Prerequisites: Chemistry 123 and 106. Two credits each quarter. Fall, Winter and Spring. Lect., T. Th. 1. *Burton*

132 or 232. Colloidal Chemistry. A course in the chemistry of colloids and their relationship to the vital processes in plant and animal life. Prerequisite: Chemistry 122. A background in Physical Chemistry is desirable. Three credits. Time arranged. *Staff*

133 or 233. Colloidal Chemistry Laboratory to Accompany Course 132. Time and credit arranged. *Staff*

134 or 234. Qualitative Organic Analysis. A study of the classification reactions and laboratory work involved in the identification of unknown organic compounds. Prerequisites: Chemistry 19 and 123. Three credits. Spring. One lecture and three labs. Lect., M. 1. Lab., time to be arranged. *Burton*

135. Chemical Literature. A study of the types of information available in technical publications; exercises in finding, assembling and using such information. Three credits. Fall quarter. One lecture and two three-hour laboratory periods in the library. Time to be arranged. (This course should precede or accompany English 111.) *Burton*

140 or 240. Physico-Chemical Methods. An advanced laboratory course. Any quarter. Time and credit arranged. *Staff*

150 or 250. Advanced Inorganic Chemistry. A study based on the periodic table and atomic structure. A course designed for Chemistry seniors and graduates and others with similar training. Given on alternate years. Three credits. Winter, M. W. F. 9. *Staff*

155. Glass Blowing. A laboratory course in the technique of manufacture and repair of laboratory glassware. This course is designed for chemistry majors. Others admitted only by special permission. Any quarter. One credit. Time arranged. *Staff*

156 or 256. Chemistry of Insecticides and Fungicides. Designed especially for advanced students in entomology, plant pathology, and agriculture; deals with the chemical composition, stability, toxicity, and effectiveness of commercial insecticides and fungicides. Prerequisite: Chemistry 12 or 122. Two credits. Winter, T. Th. 10. *Hill*

160, 260. Chemistry Seminar. Fall, Winter, and Spring. One credit. Time arranged. *Staff*

170, 270. Chemical Miscrocopy. Lecture and laboratory practice in the use of microscopes and their accessories, as applied to problems in chemistry. Practice in the examination and analysis of inorganic substances containing the more common elements, with special reference to rapid qualitative methods and to the analysis of minute amounts of material. Prerequisite: Physical Chemistry or special permission. Any quarter. Credit and time arranged. *Staff*

171, 271. Quantitative Micro-Analysis. Undergraduate and graduate. Laboratory practice in the use of the micro-chemical balance, Micro-analysis of Carbon, Hydrogen, Halogens, Sulphur, Phosphorus, Kjeldahl, Nitrogen, Dumas Nitrogen, Micro Molecular weight determinations. Prerequisites: Quantitative Analysis and Physical Chemistry. Any quarter. Credit and time arranged. *Staff*

90 or 190. Elementary Biochemistry. The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamins, and hormones and their transformations in plants and animals. Prerequisites: Chemistry 12 or equivalent. For students not majoring in Chemistry. Fall quarter. Five credits. Three lectures and two 3-hour laboratories. Lect., M. W. F. 9; Lab., T. Th. 2-5. *Greenwood*

191. Biochemistry. The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamines and hormones and their transformations in plants and animals. Prerequisites: Chemistry 122 or equivalent. For students majoring in Chemistry and others with adequate background in chemistry. Spring quarter. Five credits. Three lectures and two 3-hour laboratories. Lect., M. W. F. 9; Lab., T. Th. 2-5. *Greenwood*

192 or 292. Biochemistry. Problems of metabolism—micro-methods of blood and urine analysis with their applications to metabolism and to the diagnosis and treatment of disease. Prerequisites: Chemistry 190 or 191 or equivalent. Fall quarter. Three credits. One lecture and two 3-hour laboratories. Lect. Th. 11. Lab., T. Th. 2-5. *Greenwood*

193 or 293. Biochemistry. Preparations of enzymes or amino acids as arranged. Prerequisites: Chemistry 190 or 191. Two credits. Two three-hour laboratory periods. Any quarter. Time arranged. *Greenwood*

194 or 294. Biochemistry. Microbiological and colorimetric methods for the determination of vitamins and amino acid in plant and animal tissues. Prerequisites: Chemistry 190 or 191 and Bact. 70 or 71. Three credits. Winter quarter. One lecture and two 3-hour laboratories. Time arranged.
Greenwood

195 or 295. Advanced Biochemistry. Advanced study of carbohydrates, proteins, fats and minerals and their metabolism in plants and animals. Prerequisites: 190 or 191. Two credits. Fall quarter. Two lectures. T. Th. 1.
Greenwood

196 or 296. Advanced Biochemistry. Advanced study of enzymes and their role in plants and animals. Prerequisites: Chem. 190 or 191. Two credits. Winter quarter. Two lectures. T. Th. 1. *Greenwood*

197 or 297. Advanced Biochemistry. Advanced study of vitamins and hormones and their function in plants and animals. Prerequisites: Chem. 190 or 191. Spring quarter. Two credits. Two lectures. T. Th. 1. *Greenwood*

198 or 298. Research. Senior or graduate students majoring in chemistry may elect research in any branch of the subject. Any quarter. Time and credit arranged. *Staff*

English

N. ALVIN PEDERSEN, ALMA N. SORENSEN, *Professors Emeritus;* WALLACE J. VICKERS, KING HENDRICKS, CARLTON CULMSEE, *Professors;* IRA N. HAYWARD, *Associate Professors;* MOYLE Q. RICE, ALICE SENOB, *Assistant Professors;* STANLEY P. ANDERSEN, ANNA T. DAVIS, WILLARD A. HEED, BETTY LINDHOLM, DAN LUDLOW, VENETA NIELSEN, CALDER M. PICKETT, *Instructors.*

See pages 47 and 48 for courses that may satisfy group requirements.

English Major Requirements

Students who intend to major in English must complete English 1, 10, 53, 60, and 61 before beginning work on the required upper-division courses. It is highly desirable to complete History 34 and at least one year of a foreign language during the freshman and sophomore years.

English 105, 118, 119, 162, 196, two period courses (161, 175, 180, 190, 191), one additional literature course numbered above 120, and at least 21 credits of a foreign language are required of majors in English. Of these 21 credits, 18 may be used as a minor. English 123, The Teaching of English is recommended for English majors and teaching majors in English. Students must also maintain a "B" grade average in their major subjects. **Teaching majors in English meet the same requirements except foreign language.**

Students whose major interests are divided between English and Speech may take a composite English-Speech major. Such a major relieves the student of all requirements for a minor. English-Speech majors should take English 1, 53, 118, 119, 163, 180, 190, 191; Journalism 12 (three credits) and 112; Speech 150 (10 credits), 175, 10 hours of Interpretation, including 124, and 10 credits of Public Speaking, including either 25 or 109.

A. Drill in Essentials of English. This course is intended to assist students with English deficiencies to qualify themselves for more successful work in college composition. Students whose standings in the Freshman Placement Examination show the need of such assistance are assigned to one of the sections as a prerequisite for English 10. No credit. Fall, Winter and Spring, M. W. F. 12. *Senob and Lindholm*

1. College Grammar. Five credits. Fall, Daily 8 and Winter, Daily 9.
Vickers

2. Mechanics of Writing. A drill course in the fundamentals of sentence structure, word usage, punctuation, and spelling, with emphasis on correct diction and grammar as aids to precision in writing. Three credits. Fall, Winter or Spring, M. W. F. 10. *Davis*

5. Scientific Vocabulary. A study of word formation and derivation as a means of understanding scientific terms and of acquiring a vocabulary. Three credits. Winter or Spring, M. W. F. 11 *Andersen*

10. Sophomore Composition. Required of all students not offering its equivalent. May not be taken in the Freshman year. This course will stress correctness and effectiveness in sentence, paragraph and theme; give practice in organization ond outlining of material, and in expository writings; demand clear, forceful expression, and require a full third of a student's time. Five credits. Fall, Winter and Spring. For hours, rooms, and teachers see Class Schedule at time of registration.

11. Sophomore Composition. Should be taken in place of English 10 by sophomore students whose record in the placement test indicates special aptitude in composition. Open only to students whose placement cards are marked 'Eligible for English 11." Five credits. Fall, Daily 8. Winter, Daily 8. Spring, Daily 9. *Hayward, Nielsen and Rice*

17, 18, 19. Freshman English. For Forestry, Trades and Industries and Engineering students only. Drill in fundamentals of sentence and paragraph structure. Exercises in grammar, vocabulary, and spelling. Composition, with stress on intelligent thinking and clear expression. Practice in writing letters and reports. Three credits per quarter. Fall, Winter, and Spring, M. W. F. For hours, rooms, and teachers, see Class Schedule at time of registration.

21. Reading in Poetry. The purpose of this course is to develop appreciation for poetry. Verse forms, the various types of poems, and the idea underlying lasting poetry will be considered. Five credits. Fall, Daily 1. Winter, Daily 10. Spring, Daily 8. *Nielsen and Vickers*

22. Contemporary American Poetry. A study of the principal American poets since 1900. The purpose of the course is to help students to enjoy and understand poetry as a living art. Three credits. Winter, M. W. F. 2.

23. Contemporary British Poetry. Three credits. Spring, M. W. F. 11. *Hayward*

24. Children's Literature. Introduction to the prose and poetry of childhood and adolescence. This course is helpful to teachers and parents. Four credits. Fall, Winter and Spring, M. T. W. Th. 2. *Pedersen*

25. The Nineteenth Century Novel. Analysis of the novels of Scott, Austen, Thackeray, Cooper, and Hawthorne. Three credits. Fall, M. W. F. 11. *Heed*

26. The Nineteenth Century Novel. Analysis of the novels of Dickens, Balzac, Bronte, and Butler. Three credits. Winter, M. W. F. 11. *Heed*

27. The Nineteenth Century Novel. Analysis of the novels of Hardy, Meredith, Howells, James, Turgenev. Three credits. Spring M. W. F. 11. *Heed*

31. Floating Poetry. A study of the poetry that has lived in the oral tradition since medieval times. The course is divided into four parts: the narrative ballad, the non-narrative poem, Negro poetry (including slave songs and sprituals), and children's poety. Three credits. *Hendricks*

33. Contemporary Short Story. A study of the technique of the short story. English, American, and European stories will be analyzed. Encouragement will be given to those who wish to write. Three credits. Fall, Spring, M. W. F. 1. *Rice*

34. Nineteenth Century Short Story. Three credits. Winter, M. W. F. 11. *Rice*

37. The Essay. Writers of the present—American and English. Three credits. Winter, M. W. F. 1. *Rice*

40. World Literature. A survey course including a study of epic and romance, tragedy, comedy, satire, etc., as these forms have appeared in Greek, Roman, Hebrew, Italian, French, German, English and American literature. Five credits, Fall, Winter, Daily 10. *Sorensen*

43. Scandinavian Literature (In Translation). Selected readings from recent and traditional writers: short stories, novels, and poetry. Three credits. Fall, M. W. F. *Nielsen*

46. The Bible as English Literature. The course provides an opportunity for first hand acquaintance with the great book of books. Five credits. Spring, Daily 9. *Vickers*

47. Readings in Greek Literature. Provides an opportunity to become acquainted with both the Greek epics and the Greek dramas. Five credits. Fall, Daily 9. *Vickers*

48. Readings in Drama. Selected masterpieces of Continental, British, and American drama from the Renaissance to the present. Emphasis is placed upon the theatre as the medium of a popular art form, reflecting the cultural and social ideas of its time. Five credits. Winter, Daily 9. *Hayward*

52. American Literature. General survey of American prose and poetry from the Colonial period to the present. Five credits. Winter, Daily 10. Spring, Daily 8. *Culmsee and Hayward*

53. American Literature. A survey of American literature from the beginnings to the present, with emphasis on works of authors whose writings express the democratic spirit or in other ways portray ideas characteristic of American culture. Open to English majors or minors and to majors and minors in other departments by permission of the instructor. Five credits. Fall, Daily 11. *Hayward*

54. American Biography and Autobiography. Aimed to introduce American biography and autobiography both as an enjoyable and important form of literature, and as a source of valuable sidelights on American thought and culture. Two credits. *Hayward*

55. American Novel. The writings of the principal American novelists from Charles Brockden Brown to present. Emphasis will be placed on the novel as a form of art portraying and interpreting the American scene, past and present. Three credits. Winter, M. W. F. 1. *Lindholm*

56. American Drama. The development of American drama from Revolutionary times to the present. The principal American plays are studied in the light of the literary and social theories of the times in which they were written. Three credits. Winter, M. W. F. 8. *Hayward*

60. English Literature. A survey of the principal masterpieces of English literature from Beowulf to William Blake. Five credits. Winter, Daily 9. *Heed*

61. English Literature. A survey of English materpieces of the period from Wordsworth to the twentieth century. Five credits. Spring, Daily 9. *Heed*

63. Shakespeare. The courst offers the opportunity to gain a general knowledge of Shakespeare by reading a liberal number of his plays and participating in class discussions upon them. Three credits. Fall, F. W. F. 9. *Pedersen*

83. Wordsworth. Three credits. Winter, M. W. F. 9. *Senob*

85. Shelley. A study of his relation to the Romantic movement. Two credits. *Sorensen*

88. Browning. Chiefly a study of his monologues and selected dramas. Two credits. Spring, T. Th. 10. *Andersen*

95. Contemporary Novels. A course in the reading and interpretation of the best in twentieth century novels from England, America, France, Germany and Russia as they mirror the social and literary forces of our times. Three credits. Fall, M. W. F. 11., Winter, M. W. F. 8. *Rice and Andersen*

105. History of the English Language. A study of the evolution of the English language from the Anglo-Saxon times to the present. Three credits. *Hendricks*

110. Advanced Composition. Required of Upper Division students. The course will emphasize correctness, vocabulary, selection and organization of material, clearness, and interest in expository essays. Four credits. *Staff*

No.	Sec.	Credit	Quarter	Time	Instructor
110	1	4	Fall	M.T.W.Th. 8	*Sorensen*
110	2	4	Fall	M.T.W.Th. 10	*Nielsen*
110	3	4	Fall	M.W.Th.F. 11	*Senob*
110	4	4	Fall	M.T.W.Th. 2	*Nielsen*
110	1	4	Winter	M.T.W.Th. 8	*Davis*
110	2	4	Winter	M.T.W.Th. 10	*Hayward*
110	3	4	Winter	M.W.Th.F. 11	*Senob*
110	4	4	Winter	M.T.W.Th. 2	*Rice*
110	5	4	Winter	M.T.W.Th. 1	*Nielsen*
110	1	4	Spring	M.T.W.Th. 8	*Sorensen*
110	2	4	Spring	M.T.W.Th. 9	*Davis*
110	3	4	Spring	M.T.W.Th. 10	*Nielsen*
110	4	4	Spring	M.W.Th.F. 11	*Senob*
110	5	4	Spring	M.T.W.Th. 2	*Nielsen*

111. Technical Writing. Emphasis will be placed upon bibliography research methods and final form of the technical report. Four credits. Fall, Winter and Spring. M. T. W. Th. 1. *Heed*

117. Writer's Workshop. For students who desire special assistance in imaginative writing. Admission is granted to all who show a particular talent in the writing of prose or verse, but prospective students are required to consult the instructor before registering. Two credits. Fall, Winter and Spring, T. Th. 1. *Culmsee*

118, 119. Creative Writing. Short stories, essays, poetry. Considerable freedom of choice as to type. To register for Winter quarter exclusive of Fall quarter, consult instructor. Three credits each quarter. Fall and Winter, M. W. F. 11. *Pedersen*

123. (Education 123.) The Teaching of English. A practical course planned for those who are either teaching or planning to teach English in public schools. The purpose is to study both materials and methods in the three fundamental areas of English instruction: grammar, composition, and literature. This course satisfies part of the education requirement for the teacher's certificate. Three credits. *Hayward*

134. Literary Criticism. A study of the masterpieces of criticism from Plato and Aristotle to Croce with the aim of developing in the student an awareness of critical standards throughout the ages. Four credits. Spring quarter, M. W. Th. F. 11. *Culmsee*

135. Modern Literary Criticism. A study of critical essays since Croce, with particular attention given to T. S. Eliot and the modern American School. Four credits. *Culmsee*

143. Soviet Literature in Translation. A study of the literature produced in Soviet Russia between the year 1918 and the present. Special emphasis will be given to the works of Gorki, A. Tolstoi, Ehrenburg, Sholokov, and others. Five credits. *Hendricks*

147. Comparative Literature. A comparative study of the literature of the 18th century of France and England. Four credits. *Hendricks*

148. Comparative Literature. A comparative study of the Romantic period in England and Germany. Four credits. *Hendricks*

149. Comparative Literature. A study of the 19th Century in England, France and Russia. Four credits. *Hendricks*

Thomas Mann. (See German 153.)

158. Hawthorne and Melville. The essays, tales and novels of the two major novelists of the early national period in American history. Emphasis is placed upon political, social, and philosophical ideas that each author reflects. Three credits. Spring, M. W. F. 11. *Hayward*

159. Emerson and Thoreau. A study of the essays, lectures, and poetry of the two principal figures of the Concord Group as representatives of the literature and thought of their time and as thinkers whose ideas are still important. Three credits. *Hayward*

161. Medieval Literature. English literature from Beowulf to Wyatt and Surrey exclusive of Chaucer. Emphasis is placed on the epic and the metrical romance. Some continental literature is included. Reading i sdone in translation. Five credits. Winter, Daily 11. *Vickers*

162. Chaucer. Relation of Chaucer to his time; his influence upon subsequent literature. Emphasis upon oral reading. Five credits. Winter, Daily 10. *Pedersen*

163. Shakespear. A study of six plays: Macbeth, Henry IV, King Lear, Hamlet, Othello, Twelfth Night; collateral readings. Five credits. Spring, Daily 10. *Pedersen*

164. Elizabethan Playwrights, Exclusive of Shakespeare. Plays selected from the writings of Marlowe, Dekker, Jonson, and others. Three credits. Fall, M. W. F. 10. *Senob*

167. Arthurian Legends. A study of Arthurian Legends and their relation to English Literature. Three credits. Spring, M. W. F. 11. *Nielsen*

170. Milton. Selected prose and poetry with special emphasis on Paradise Lost. It is desirable, though not necessary, to have English 46 and 47 before taking this course. Five credits. *Vickers*

175. Elizabethan and Stuart Literature. A study of the poetry and prose works, exclusive of those of Shakespeare and Milton, from 1568 to 1660. Five credits. Spring, Daily 11. *Rice*

180. The Eighteenth Century. A comprehensive study of the literature from 1660 to 1798. Five credits.

185. Eighteenth Century Novels. This course will examine a limited and selected number of works, with particular attention paid to Tom Jones and Tristram Shandy. Two credits. Fall, T. Th. 10. *Senob*

190. Romantic Period. A brief study of the precursors of romanticism; a study of the literature from 1790-1832, with emphasis on poetry. Five credits. Fall, Daily 2. *Staff*

191. The Victorian Period. A comprehensive review of the literary influences and personalities of the period, with emphasis on the chief poets and prose masters of the age. Five credits. *Hayward*

193. Arnold and Carlyle. Two credits. *Staff*

195. Readings and Conference. Time and credit arranged. Any quarter. Limited to English majors. *Staff*

196. Methods and Materials for English Study. Intended to introduce English majors to the approved methods of advanced study in English. Major emphasis is on the use of the library, the compilation of bibliographies, and the writing of course papers. Required of all English majors in the junior year. Three credits. Fall, M. W. F. 12. *Hayward*

JOURNALISM

Major students in Journalism should complete English 1, 5, 10, 12, 13, 14, 16, 52, 110, 112, 113 or 156, 114, 115, 116, 117 or 118 or 119, 120.

They are urged to complete as many of the following as possible: English 40, 46, 60, 61, 63, 105, 134. It is recommended that a minor be selected from the following: Accounting, Art, Business Administration, Economics, History, Modern Languages, Political Science, Psychology, Sociology, Speech.

4. Exploring Journalism. An introduction to the subject, with discussions of opportunities in journalistic vocations and qualifications for success in these fields. Practice in various types of writing is given to enable students to estimate their aptitudes and interests. Two credits. Fall, T. Th. 9. *Culmsee*

12. Newspaper Reporting. Lectures, practice, and group discussion on the work of the reporter and correspondent. Students are required to cover assignments for college, local, and state newspapers. Three credits. Fall. M. W. F. 11. *Pickett*

13. Newspaper Reporting. A continuation of 12 with emphasis on newspaper style, ethics, social responsibilities and problems of reporting. Practical experience writing for newspapers. Prerequisite: 12. Three credits. Winter, M. W. F. 11. *Pickett*

14. Advanced Reporting. A continuation of 13. Lectures, class practice and experience. Prerequisites: 12 and 13. Three credits. Spring, M. W. F. 11. *Pickett*

16. Editorial Page. A study of editorials and other elements of the modern editorial page, and the writing of editorials. Two credits. Fall, T. Th. 10. *Andersen*

81. Radio Speech. (See Speech Department for description.) Three credits. Fall and Spring, M. W. F. 2-4.

112. The Writing of Feature Articles. Lectures and practice in preparing feature articles for newspapers and magazines. Analysis of periodicals will be made to determine available markets and what editors will buy. Three credits. Winter, M. W. F. 9. *Culmsee*

113. Publicity Methods. A detailed study of media and methods used to inform the public and conduct public relations work as required by corporations, public institutions, service organizations, and governmental agencies. Prerequisites: 12, 13, 14. Three credits. Spring, M. W. F. 9. *Andersen*

114. Writing for Radio. Study and practice in writing information and interpretive continuity for radio programs. Three credits. Winter, M. W. F. 2. *Andersen*

115. Law of the Press. The law of libel, right of privacy, contempt of court, freedom of the press, copyright, and postal regulations. Two credits. Spring, T. Th. 10. *Andersen*

116. History of Journalism. American newspaper men and their contributions to journalism; also modern newspaper trends. Five credits. Spring, Daily 8. *Culmsee*

120. Agricultural Journalism. Problems of writing for, editing, and publishing weekly newspapers and magazines. Emphasis on writing farm and home news. Intended to aid agricultural extension workers and others in preparing material for rural publications. Three credits. Winter, M. W. F. 10. *Pickett*

121. Copyreading. Primarily a laboratory course in handling of newspaper copy, headline writing, page layouts. Prerequisites: Journalism 12, 13. Three credits. Spring, Lecture, M. 1; Lab., T., 1-6. *Pickett*

124. Public Opinion and Propaganda. (See Political Science 124.) Three credits. Fall, M. W. F. 11.

156. Principles of Advertising. (See Merchandising Department, School of Commerce, for description.) Five credits. Winter, Daily 8.

Geology

J. STEWART WILLIAMS, *Professor;* PHILIP F. FIX, *Associate Professor.*

Geology Club: The Geology Club, an organization of geology students under the superivision of the Department of Geology meets in the lecture room of the department at 8:00 p. m. on the second Thursday of each month. The programs consist of talks by guests, faculty members, and students. All interestd persons are invited to attend. Regular attendance is required of all geology majors.

Major in Geology: The following courses, or their equivalents, outside the Department of Geology, are required of Geology majors: Chem. 3, 4, and 5; C. E. 81, 82, and 83; English 110 and 111; Physics 20, 21, and 22; Math. 34, 35, and 46. The following courses in the department, are required of majors: 1 or 3, and 2; 101, 102, 106, 108, 110, 112 or 113, 114, 115, and 120.

Field Trips: Since field work is a very essential part of the study of Geology, majors should be prepared to devote most of the Saturdays during the Fall and Spring quarters to this work. Two longer field trips, each of several days' duration, are taken each year, one in the Fall quarter and one in the Spring quarter. Majors should plan to take as many of these trips as possible, and attendance on the majority of the trips is required for a major.

MASTER OF SCIENCE DEGREE IN GEOLOGY

The Geology Department offers work toward the Master of Science degree in the fields of invertebrate palentology, stratigraphy, areal geology and ground water geology. The following courses in the 100 series may be used for graduate credit by students majoring in the department of Geology: 102, 103, 107, 112, 113, 116, 117.

Any or all courses in the 100 series may be used for graduate credit by students in other departments.

1. Introductory Physical Geology. A general survey course of the whole field of physical geology for arts students and others who desire only a broad introduction to the subject. This course is continued in Geology 2, for which it is a prerequisite. Closed to students who have had Geology 3 or equivalent. A one-day field trip is required in Fall and Spring quarters. Five credits. Fall, Winter, Spring. *Fix*

2. Introductory Historical Geology. A continuation of Geology 1 covering historical geology. Prerequisite: Geology 1. Five credits. Winter. *Williams*

3. Physical Geology. Designed for forestry, engineering, and soils students and others who desire a substantial introduction to physical geology. Not open to students who have taken Geology 1 or equivalent. A five dollar deposit is required for loss and breakage of equipment. A one-day field trip required. Fall and Spring quarters. Five credits. Fall, Winter, Spring. *Williams*

101. Mineralogy. Identification of the common minerals by means of physical and chemical tests. Elementary crystallography. Prerequisites: Geology 3 and Chemistry 3, 4, and 5, or equivalents. Five credits. Fall. *Fix*

102. Optical Mineralogy and Petrography. Optical properties of the common rock-forming minerals, and identification of these minerals in thin-sections and in refractive-index media with the petrographic microscope. Introduction to the classification of rocks, and correlation with the field classification. Prerequisites: Geology 101 and Physics 22. Five credits. Winter. *Fix*

103. Engineering Geology. The application of Geology to engineering problems. A course for seniors in Engineering. Three credits. Spring. *Fix*

104. Regional Geology of the United States. A study of the major geologic structures and land forms of the physiographic provinces of the United States that have influenced the exploration, settlement, and industrial development of the nation. Prerequisite: Geology 1 or 3, or equivalent. Two and one-half credits. Summer Quarter. *Staff*

106. Invertebrate Paleontology. An introduction to the study of fossils. A living example of each of the groups of animals with important fossil representatives will be used as an introduction to the fossil forms of that group. Methods of preparation and study will be developed from work upon material collected by the student himself. Prerequisite: Geol. 2 and Zoo. 3. Five credits. Winter. *Williams*

107. Igneous Petrography. Identification and classification of the igneous rocks by study of thin-sections with the petrographic miscroscope. Prerequisite: Geology 102. Three credits. Spring. *Fix*

108. Stratigraphy. An introduction to the processes by which the sedimentary rocks have been formed, and to their original structures, followed by a study of the stratigraphic systems and their identification by guide fossils. Field trips required. Prerequisites: Geol. 3 and Geol. 106. Five credits. Spring. *Williams*

110. Structural Geology. The types and origin of rock structures, and their role in the formation of mineral veins, petroleum and natural gas fields, and the general architecture of the Earth. Prerequisite: Geology 3 or equivalent. Five credits. Winter. *Fix*

112. Economic Geology-Nonmetals. The geologic occurrence and distribution of petroleum, natural gas, coal, building materials, and other non-metallic resources. Prerequisite: Geology 101 and 110. Five credits. Winter. *Fix*

113. Economic Geology-Metals. The geologic occurrence and distribution of the metalliferous deposits of the world. Prerequisite: Geology 101 and 110. Five credits. Fall. *Fix*

114. Field Methods. Field practice in measurement of the attitude and thickness of formations, field use of topographic maps, and note taking. Mapping by pacing and compass, and plane table. Prerequisites: Geol. 3, C. E. 81 and 82. Five credits. Spring. *Williams*

115. Advanced Physical Geology. A study of those phases of geology that are of particular interest to students of conservation in the Western States. Processes of erosion, action and development of streams, land forms, subsurface water, etc. Prerequisites: Geol. 3 and College Mathematics, Chemistry and Physics. Five credits. Fall. *Williams*

16 or 116. Special Problems. Direction in the study of special problems in which a student has become interested, and upon which he desires to make written reports. From one to six credits, not to exceed two in any quarter. Time arranged. *Williams or Fix*

117. Ground Water Geology. The geologic conditions that control the occurrence and quality of ground water, with special reference to western United States. Prerequisite: Geology 3 or equivalent. Two credits. Spring. *Fix*

120 or 220. Thesis. Senior college or graduate thesis. A thesis on some field problem is required of majors and five credits are given for its completion. Registration for this undergraduate thesis is limited to the Fall or Spring quarter. It must be for five hours and the thesis must be completed in one quarter.

Registration for the graduate thesis may be for one, two or three quarters and nine to fifteen credits are given for its completion. *Williams or Fix*

230. Graduate Seminar. Two to five credits. Any quarter. Time arranged. *Williams and Fix*

History

JOEL E. RICKS, JOHN DUNCAN BRITE, *Professors.*

See pages 47 and 48 for courses that may satisfy group requirements.

Students majoring in History should complete the following classes: History 1, 2, 13, 14, 105, 106, 124, 126, 135, 171A, 175, 190. Students majoring should consult the head of the department for registration.

History majors intending to pursue graduate work should complete two years of French or German.

1. Early European History. A survey of the medieval and early modern European periods from the fall of the Roman Empire through the period of the Renaissance, the Reformation and the religious wars. This course is especially planned for those desiring to know the salient movements and events of the Middle Ages. It will include a study of feudalism and chivalry, the rise of towns and centralized government, the history of the medieval church and of Islam, and the Crusading movement. Five credits. Winter, Daily 10.
Brite

2. Modern European History. A survey of the early and recent periods of modern European history from the seventeenth century to the Second World War. This course is especially planned for those desiring to know the salient movements and events of modern Europe. It includes a study of overseas expansion, the rise of parliamentary government, the age of reason, the French Revolution and Napoleon, the growth of liberalism and nationalism in the nineteenth century, the Industrial Revolution, the rise of Socialism, and the causes and results of the World War of 1914. Five credits. Spring, Daily 10.
Brite

4. World Civilizations. Survey of the civilizations of the world from ancient times to the sixteenth century. This course is planned to meet the needs of students who wish to understand the main currents in world development and who do not have time for a more detailed course. Attention will be given to the life, principal contributions, and significance of past civilizations. Five credits. Fall, Daily 9, 10. Winter, Daily 9. Spring, Daily 8. *Ricks and Brite*

8. Recent European History. This course will cover the period from the Treaty of Versailles in 1919 to the present time, emphasizing the problems following the last war and the underlying causes of World War II. Three credits. Fall, M. W. F. 11. Winter, M. W. F. 11. Spring, M. W. F. 9.
Ricks and Brite

13. Early United States History. A survey of United States history from the earliest times through the Civil War. This course is for those who wish to understand the important movements and institutions of America. It will include the colonization of the Atlantic seaboard, the Westward Movement, the Revolution, the Constitution, the beginnings of American government, the rise of American democracy, social and economic movements, the rise of sections, expansion, nationalism and the Civil War. Five credits. Fall, Daily 9.
Ricks

14. Modern United States History. A survey of United States history from the close of the Civil War to the present. This course is for those who wish to understand the significant movements and events of the modern United States. It will include reconstruction, industrialism, the last frontier, the agrarian revolts, imperialism, the eras of reform, American culture, the new democracy and the two World Wars. Five credits. Winter, Daily 9. Spring, Daily 10.
Ricks

21. Hispanic American History. This course is planned to meet the needs of students who desire to understand the main developments in America south of the United States. A brief survey of the beginnings and colonial development of Spanish and Portuguese America will be followed by a more detailed study of the revolutions, establishment of republics, the culture and international relations of the Hispanic American nations, and will include the Monroe Doctrine and Pan-American proposals. Five credits. Winter, Daily 10.
Ricks

22. The Pacific Area and Asia. This course will emphasize the modern problems of the Pacific areas and Asia. It will include also a brief survey of the cultures and history of these peoples as well as a more intensive study of their movements and aspirations. The background and nature of the Second World War in the Pacific and Asia will be included. Three credits. Spring, M. W. F. 11. *Ricks*

34. **English History.** A survey of English history from the earliest times to the present day. The period before 1485 will be rapidly reviewed. The emphasis will be placed upon the period of the Tudor and Stuart rulers, the growth of the British Empire, and the impact of modern forces like the Industrial Revolution upon the British Isles. Five credits. Fall, Daily 8. *Brite*

105. **Greek History.** A study of the civilization of the Hellenic peoples from their beginnings in the days of Aegean civilization. While the politics, arts, literature, and philosophy of the fifth and fourth centuries B. C., will be stressed, attention will be paid to the spread of Greek culture throughout the Mediterranean world during the time of Alexander the Great. Four credits. Arranged. *Brite*

106. **Roman History.** From the beginnings of the Roman Republic to the decline and fall of the Empire in the fifth century A. D. Three credits. Arranged. *Brite*

124. **European History.** Renaissance and Reformation. Study of the Renaissance in all western European countries in the thirteenth, fourteenth, fifteenth and sixteenth centuries. Protestant Revolution and Catholic Reformation movements in Western Europe. Five credits. Fall, Daily 10. *Brite*

126. **European History.** The French Revolution and Napoleon. Three credits. Winter, T. Th. 8, M. 1. *Brite*

135 or 235. **United States History.** History of the Far West. This course will deal with the region from the Rockies to the Pacific Coast with special emphasis upon the Intermountain West. Five credits. Spring, Daily 8. *Ricks*

171A. **United States History.** Constitutional History of the United States to present. Three credits. Fall, T. Th. 8, M. 1. *Ricks*

175. **History of American Democratic Thought.** This course will trace American democratic thought from the Revolutionary War to the present. Three credits. Fall, M. W. F. 11. *Ricks*

190 or 290. **Historical Research.** Two credits. Winter. Hours to be arranged. *Ricks and Brite*

Landscape Architecture and Planning

Administered jointly by the School of Agriculture and the School of Arts and Sciences

LAVAL S. MORRIS, *Professor;* KENJI SHIOZAWA, *Assistant.*

3. **Elements of Landscape Architecture and Planning.**
20. **Drawing.**
30. **History and Literature of Landscape Architecture.**
40, 41. **Plant Materials.**
60, 61, 62. **Architectural Design.**
130. **Recreational Planning.**
140, 141, 142. **Design.**
150, 151, 152. **Planting Design.**
160, 161, 162. **Landscape Construction.**
170. **Civic Planning.**
180, 181, 182. **Advanced Planning and Design.**
190. **Special Problems.**
195. **Seminar.**
210. **Advanced Problems.**

See Landscape Architecture in School of Agriculture for course descriptions.

Mathematics

V. H. TINGEY, *Professor;* RALPH L. CALVERT, NEVILLE C. HUNSAKER, *Assistant Professors;* MARY NELSON, JOE ELICH, IVOR E. BRADLEY, *Instructors.*

See pages 47 and 48 for courses that may satisfy group requirements.

Two types of majors are offered in the Mathematics Department. Students intending to do graduate work in mathematics take the regular major. Those intending to teach in high schools take the regular major or the teaching major.

Regular Major: Mathematics 60, 97, 98, 99, 100, 118, 119, 120, 121, 122, 123, 130, 131, 152, 153. Students who have had the equivalent of any of the above will not be required to take that particular course. Physics 20, 21, 22, and nine credits additional in either Physics or Chemistry of senior college grade are required. Chemistry 3, 4, and 5 are required. A reading knowledge of French and German is strongly recommended.

Teaching Major: Students expecting to teach mathematics in high schools must meet the state requirement for certification. Teaching majors must take the following courses or their equivalent: Mathematics 33, 34, 35, 97, 98, 99, 100, 111, 118, 119, 120, 121, 123, 130, 131, 153; also Physics 20, 21, 22; Chemistry 3, 4, 5; and nine additional credits of Physics and Chemistry of upper division grade.

One year of high school algebra and one year of high school plane geometry are prerequisite to all college mathematics.

33. Solid Geometry. Two credits. Fall, T. Th. 9, 1. Winter, T. Th. 8, 1. Spring, T. Th. 8. *Staff*

34. Introduction to College Alegbra. (For Engineers only.) Three credits. Fall, M. W. F. 9, 1. Winter, M. W. F. 8, 1. Spring, M. W. F. 8. *Staff*

34. Introduction to College Algebra. Prerequisite: One year of high school algebra. Students who have had more than one year of high school algebra will not be given college credit for Mathematics 34. Three credits. Fall, M. W. F. or T. Th. S. 8, 9, 10, 1, 2, 3. Winter, M. W. F. 8, 1, 2, 3. Spring, M. W. F. 8. *Staff*

35. College Algebra. Prerequisite: 34. Five credits. Fall, Daily 8, 9, 10, 1, 2, 3. Winter, Daily 8, 9, 10, 1, 2, 3. Spring, Daily 8, 9, 1. *Staff*

46. Plane and Spherical Trigonometry. Prerequisite: 35. Five credits. Fall, Daily 8, 1, 2. Winter, Daily 8, 9, 1, 2. Spring, Daily 8, 9, 10, 1. *Staff*

50. Descriptive Astronomy. Three credits. Spring, M. W. F. 10. *Calvert*

60. Mathematics of Finance and Life Insurance. Prerequisite: 35. Three credits. Winter, M. W. F. 10. *Staff*

97. Plane and Solid Analytical Geometry. Prerequisite: 35 and 44. Five credits. Fall, Daily 8, 9, 1. Winter, Daily 8, 9. Spring, Daily 8, 9, 1. *Calvert*

98. Differential Calculus. Prerequisite: 97. Five credits. Fall, Daily 8, 9. Winter, Daily 8, 9, 1. Spring, Daily 8, 9. *Tingey*

99. Integral Calculus. Prerequisite: 98. Five credits. Fall, Daily 8, 9. Winter, Daily 8, 9. Spring, Daily 8, 9. *Tingey*

100. Calculus. Prerequisite: 99. Three credits. Spring, M. W. F. 10. *Tingey*

111. Statistics. Prerequisite: 35. Not open to lower division students. Five credits. Fall, Daily 10. *Tingey*

118. Modern Algebra. Prerequisite: 99. Three credits. Winter, M. W. F. 1. *Elich*

119. Theory of Equations. Prerequisite: 99. Three credits. Winter, Time arranged. *Staff*

120. **Modern Geometry.** Prerequisite: 97. Three cerdits. Spring. Time arranged. *Calvert*

121. **Projective Geometry.** Prerequisite: 99. Three credits. Spring, M. W. F. 9. *Calvert*

122. **Ordinary Differential Equations.** Prerequisite: 99. Three credits. Fall, M. W. F. 8, 11. Spring, M. W. F. 8, 11. *Elich*

123. **Number Theory.** Prerequisite: 99. Three credits. Spring, T. Th. 9. One hour arranged. *Elich*

130. **Advanced Calculus.** Prerequisite: 100. Three credits. Fall, M. W. F. 1. *Hunsaker*

131. **Advanced Calculus.** Prerequisite: 130. Three credits. Winter, M. W. F. 1. *Hunsaker*

152. **Partial Differential Equations.** Prerequisite: 131. Three credits. Spring, M. W. F. 1. *Hunsaker*

153. **Mathematical Readings.** Prerequisite: 123. Three credits. Spring, M. W. F. 10. *Tingey*

Military Science and Tactics

GROUND AND AIR

COLONEL E. W. TIMBERLAKE, *CAC, Commandant, PMS and T.*, LT. COL. JAMES C. BRADFORD, *QMC;* LT. COL. HAROLD E. COTTER, *AC;* MAJOR HAROLD D. HIGGINS, *CAC;* MAJOR JOSEPH R. MEACHAM, *CAC;* CAPTAIN WILBUR J. SCHINDLER, *AC,* CAPTAIN ALLEN G. MCCLURG, *Assistant Professors;* M/SGT. JOHN L. HOLLAND, *DEML;* M/SGT. NORMAN F. JONES, *DEML;* M/SGT. FREDERICK V. MCWOLD; 1ST SGT. MARVIN L. BRIMMER, *DEML;* T/SGT. BONNER D. WIMBERLY, *DEML;* S/SGT. CHARLES J. LEPLEY, *DEML;* S/SGT. PAUL H. WESSMAN, *DEML;* TEC. 3 VAL M. JOHNER, *DEML, Instructors;* PROFESSOR N. W. CHRISTIANSEN, *Band Instructor.*

For students who wish to qualify for a Regular Army commission, a department major in Military Science and Tactics is offered through the School of Arts and Sciences. In the post-war period the colleges and universities of the nation will be called upon to supply the majority of the officer personnel needed for the Regular Army and Marine Corps.

Students majoring in Military Science and Tactics must complete the following requirements: M. S. and T., 36 credits; Mathematics 34, 35, 46, 97, min. 30 credits; French, German, Portuguese or Spanish, two years; Surveying 81, 82 and 83, 8 credits; Chemistry 3, 4 and 5 or 10, 11 and 12, 15 credits; Physics 20, 21 and 22, 15 credits; Political Science 10 and 102, 8 credits; History 17 and 21, 10 credits.

See separate Military Science and Tactics section for descriptions of courses and other details.

Modern Languages and Latin

GEORGE A. MEYER, *Professor;* GEORGE C. JENSEN, *Professor Emeritus;* THELMA FOGELBERG, MARION L. NIELSEN, *Associate Professors;* ALDYTH THAIN, FRANCIS C. GOLFFING, *Assistant Professors;* JESSE G. NELSON, *Instructor.*

Elementary language courses of two types are provided in French, German and Spanish.

Intensive elementary language courses numbered 1A, 2A are designed for students who wish to acquire a speaking as well as a reading knowledge of the language in a shorter space of time than required for the **standard** elementary courses. Classes of the intensive type meet ten times per week, two hours daily, with seven hours credit per quarter, for Fall and Winter quarters. One hour daily is used for lecture and one hour for drill in oral-aural training. The equivalent of the standard first year of modern language is completed in two quarters. Special courses for advanced work are provided for those who have satisfactorily completed the intensive two quarters course.

Standard 5 credit elementary courses are provided for those whose aim is primarily a reading knowledge of a foreign language, and the satisfying of language requirements. These classes meet one hour daily per week with 5 credits per quarter.

Elementary language sections will be limited to an enrollment of twenty.

Students desiring to enroll in language classes will consult with the instructor in order to be placed to their best advantage.

To conform with national standards the faculty has ruled that no credit in a beginning language may be used towards graduation until at least 14 credits have been accumulated.

Major in a modern language:

French: The following courses are required: 1, 2, 3, 101, 102, 105, 110 and twelve credits numbered above 110.

German: Forty-five credits including 1, 2, 3, 101, 102, and fifteen credits from courses numbered above 103.

FRENCH

1A, 2A. Elementary French. Intensive Course. Seven credits per quarter. F. W. Daily 9 and 1. *Meyer*

1, 2, 3. Elementary French. Five credits per quarter. F. W. S. Daily 9. *Golffing*

101A. Intermediate French. Intensive Course. Five credits. Spring, Daily 9. *Meyer*

102A. Intermediate French. Five credits. Fall. Daily 10. *Thain*

105. Advanced Composition and Conversaition. Three credits. Winter. M. W. F. 11. *Fogelberg*

106, 107, 108. Selective Readings. Open to students who have completed French 102 or its equivalent. Readings and reports in various fields, scientific or literary. One or two credits. Fall, Winter, Spring. Arranged. *Staff*

109. French Short Story. A study of the French Conte as a literary form from the earliest times. The course will serve as an introduction to literary movements in France. Special emphasis on the 19th century. Three credits. Spring. M. W. F. 2. *Meyer*

110. French Phonetics. Principles of French pronunciation and their practical application. Three credits. Fall, M. W. F. 2. *Meyer*

120. The Comedies of Moliere. A study of Moliere's plays as social criticism. Two credits. Fall, T. Th. 2. *Meyer*

121. French Classic Drama. A study of the plays of Corneille and Racine. Two credits. Winter, T. Th. 2. *Staff*

122. Nineteenth Century French Drama. Study of the Romantic and Realistic Schools. Two credits. Spring, T. Th. 9. *Fogelberg*

129, 130. French Literature of the 18th Century. Special emphasis on the philosophy of the period—Voltaire, Rousseau, Buffon, Diderot. Two credits each quarter. Fall and Winter. Time arranged. *Meyer*

131. The Comedies of Beaumarchais and Marivaux. Two credits. Spring. Time arranged. *Staff*

135, 136, 137. Nineteenth Century French Novel. Two credits. Fall, Winter, and Spring. Time arranged. *Fogelberg*

GERMAN

1A, 2A. Elementary German. Intensive Course. Seven credits per quarter. Fall, Winter, Daily 9 and 1. *Jensen*

1, 2, 3. Elementary German. Five credits per quarter, F. W. S.

Sec. I, Daily 9. *Nielsen*
Sec. II, Daily 1. *Nelson*
Sec. III, Daily 11. *Golffing*

101A. Intermediate German. Intensive. Five credits. Spring, Daily 9. *Jensen*

102A. Intermediate German. Five credits. Fall, Daily 1. *Nielsen*

105. Advanced Composition and Conversation. Three credits. Winter, M. W. F. 8. *Staff*

106, 107, 108. Selective Readings. Open to students who have completed German 102 or its equivalent. Readings and reports in various fields, scientific or literary. One or two credits. Fall, Winter, Spring. Arranged. *Staff*

110, 111, 112. Scientific German. Reading of scientific texts. Reports. Fall, Winter, Spring. Two credits per quarter. Time arranged. *Nelson*

120. Die deutsche Novelle im 19. Jahrhundert. The reading and discussion of representative stories by Hauff, Storm, Heyse, Meyer, Keller, and others. Three credits. Fall. Time arranged. *Staff*

121. Lessing—Plays and Biography. Two credits. *Staff*

122. Schiller—Poetry, Plays and Biography. Two credits. Spring. Time arranged. *Staff*

123. Die deutsche Novelle im 20. Jahrhundert. Representative stories by Thomas Mann, Heinrich Mann, Herman Hesse, Schnitzler, and others. Two credits. Winter. Time arranged. *Staff*

130. Goethe's Faust. Prerequisite, two years of college German or its equivalent. Three credits. Winter. Time arranged. *Staff*

131. Goethe's Prose. Werther, Dichtung und Wahrheit, and selections from Wilhelm Meister. Reading of a biography of Goethe. Three credits. Spring. Time arranged. *Staff*

132. Heine's Poetry and Prose. Three credits. Fall. Time arranged. *Staff*

133. German Drama of the Nineteenth Century. Rapid reading and discussion of representative plays from Kleist to Hauptmann. Three credits. *Staff*

150. Schnitzler's Stories and Plays. Two credits. *Staff*

151. Hauptmann's Plays and Novels. Two credits. *Staff*

153. Thomas Mann—Novels, Novellen, and Essays. His life and philosophy receive consideration. The course will be conducted in English and readings will be in translation. Either German or English credit will be given. Three credits. *Nielsen*

SPANISH

1A, 2A. Elementary Spanish. Intensive Course. Seven credits per quarter. Fall, Winter. Daily 10 and 1. *Fogelberg*

1, 2, 3. Elementary Spanish. Five credits per quarter. Fall, Winter, Spring.

Sec. I, Daily 9. *Thain*

Sec. II, Daily 1. *Thain*

101A. Intermediate Spanish. Intensive Course. Five credits. Spring. Daily 10. *Fogelberg*

102A. Intermediate Spanish. Five credits. Daily 9. *Fogelberg*

105. Advanced Composition and Conversation. Three credits. Winter, M. W. F. 9. *Fogelberg*

106, 107, 108. Selective Readings. Open to students who have completed Spanish 102 or its equivalent. Readings and reports in various fields, scientific or literary. One or two credits. Fall, Winter, Spring. Arranged. *Staff*

PORTUGUESE

1, 2, 3. Elementary Portuguese. Grammar, dictation, conversation and reading. Study of the history and culture of Brazil and Portugal. Five credits. Fall, Winter, Spring. Daily 10. *Meyer*

101, 102, 103. Second Year Portuguese. Grammar, reading, conversation and composition. Fall, Winter, Spring. Arranged. *Meyer*

106, 107, 108. Selective Readings. One or two credits. Fall, Winter, Spring. Arranged. *Meyer*

LATIN

1, 2, 3. First-Year Latin. An introductory course with special emphasis on the relation of Latin to English. Study of vocabulary and word-formation as an aid to better comprehension of our own tongue. Especially recommended for English majors and for pre-law and pre-medical students. The course includes readings from Caesar and various other Latin writers. Five credits each quarter. Fall, Winter, and Spring, Daily 10.

101, 102, 103. Virgil and Cicero. Selected readings from the orations of Cicero and Virgil's Aeneid. Also miscellaneous readings from Pliny, Catullus, Ovid, and other Roman authors. During the year there will also be readings in English in the history of Roman literature. This course is open to all students who have had one year of college Latin or two years of high school Latin. Three credits each quarter. Fall, Winter, and Spring. Time arranged. *Nielsen*

SPECIAL SERVICE COURSES

21. French Pronunciation. Designed primarily for students in Music, Art, Speech, and Radio. Available to others. Basic drill on pronunciation with special attention to the terminology and proper names encountered in the fields of music and art. Two credits. Winter. T. Th. 1. *Jensen*

22. Itlaian Pronunciation. Same as for coures 21. Fall. T. Th. 1. *Jensen*

23. German Pronunciation. Same as for course 21. Spring. T. Th. 1. *Jensen*

80. Medical Latin. Three credits. Fall. M. W. F. 12. *Golffing*

81. Medical Greek. Three credits. Winter. M. W. F. 12. *Golffing*

Physics

WILLARD GARDNER, *Professor;* ROLLAND R. PERRY, PHILIP J. HART, L. S. COLE, *Associate Professors;* E. W. PAYNE, JAY O. JENSEN, *Assistant Professors.*

Mathematics 34 or equivalent must precede or parallel Physics 6, 7, 20, 21, or 22, whichever is taken first.

See pages 47 and 48 for courses that may satisfy group requirements.

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100.

Suggested courses. The course taken will depend on whether the student wishes to continue with graduate work in Physics or whether he desires to teach in high school. Substitutions or changes must be approved by the head of the department. For each year, the first group of courses should be taken by all majors. Those courses preceded by (**) are for students preparing to do graduate work; and those preceded by (†), are for prospective high school teachers. A minimum of 30 senior college credits in Physics must be obtained.

Freshman Year: Physics 20, 21, 22; Math. 34, 35, 46; Bacteriology 1; Economics 51; **(5 hours Social Science); †(Sociology 70).

Sophomore Year: Math. 97, 98, 99; Chem. 3, 4, 5; **(German 1, 2, 101); †(Physiology 4; English 10; Psychology 3).

Junior Year: Physics 120, 121, 130. Math. 119, 120, 122; **(German or French; English 110; 5 hours Biological Science; 5 hours elective); †(Psychology 102a); Education 111, 113, 114; Speech 1, English 110.

Senior Year: Physics 145, 153, 154, one other year course in Physics; **(Math. 130, 131; Chem. 104, 105, 106; Physics 108, 193, 194, 195); †(Chem. 121; Education 127, 129a and 129b [Winter and Spring] 5 hours; Language group Electives 3-8 hours).

A Teaching Minor in Physics will be approved only for students majoring in closely related fields. Such students must complete Physics 20, 21, 22.

1. Household Physics. Designed primarily for Home Economics Majors. The course covers selected topics in Physics of practical importance in the household, with heat and electricity receiving greatest emphasis. Five credits. Any quarter. Lecture M. T. W. Th. 1. Laboratory F. 1-3 or 3-5. *Payne*

3. Introductory Physics. A non-technical course in physics designed for students who do not expect to major in the exact sciences but who want a knowledge and understanding of the fundamental physical principles and their applications. Five credits. Any quarter. Lecture, Daily 10. Laboratory F. 2-4, for students wishing it. *Jensen and Payne*

6, 7. General Physics. Physics 6 covers mechanics, constitution of matter, heat, and meteorology. Physics 7 includes primarily electricity and magnetism, with a survey of the fields of light and sound. Primarily designed for students in Forestry and Agriculture. Five credits.

Physics 6—Fall or Winter. Physics 7—Spring. Lect., M. W. Th. F. 11; Quiz section Th. 11; Lab., (One of the following periods) T. or Th. 8-10. *Jensen*

16. Introductory Meteorology. Intended to give a non-mathematical treatment of fundamental physical laws governing the atmosphere and its phenomena. A brief study of the polar-front theory, air-mass analysis, weather map reading, and forecasting. This course coveres information required by the Civil Aeronautics Administration for flying. Three credits. Fall, Winter and Spring, M. W. F. 8. *Jensen*

17. General Meteorology. (Physics of the Air.) A study of atmospheric physics and weather phenomena from both the dynamic and synoptic procedures. A brief study of meteorological apparatus, observations, map reading, forecasting and including all of the basic principles of aeronautical meteorology. Prerequisite, Physics 6 or 22. Five credits. Fall, Winter, Spring, Lecture M. T. W. Th. 2; Lab. F. 2-4. *Staff*

20, 21, 22. Mechanics and Molecular Physics. Electricity and Magnetism. Heat, Light, and Sound. A course designed for Science majors, Engineers, and students preparing for Medicine. Recommended for majors in Agriculture who intend to do graduate work. Prerequisite, high school Physics and a working knowledge of trigonometry. Students not majoring in Physics should take this in the sophomore year. Five credits.

Sec. 1. Given in order 20, 21, 22. Lect. M. W. F. 8; Quiz section T. Th. 8. Lab. M. W. 1-3 or 3-5, or T. Th. 1-3 or 3-5. *Payne*

Sec. 2. Given in order 21, 22, 20. Lect. M. W. F. 9; Quiz section T. Th. 9. Lab. M. W. 1-3 or 3-5, or T. Th. 1-3 or 3-5. *Hart*

Sec. 3. Given in order 22, 20, 21. Lect. M. W. F. 2; Quiz section T. Th. 2. Lab. M. W. 8-10 or 10-12, or T. Th. 8-10 or 10-12. *Perry*

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100.

Physical Chemistry. See Chemistry 104, 105, 106 and Chemistry 109, 110, 111.

At the beginning of each quarter, the schedule of the following Advanced Physics courses will be arranged to meet the requirements of all registered students.

108. Advanced Laboratory Work. Recommended for students majoring in Physics. Can be taken only by special arrangement. Any quarter. Time and credit arranged. *Staff*

114. Soil Physics. The fundamental laws of Physics will be reviewed, with emphasis on mechanics and thermodynamics and their relation to soil problems. Some time will be devoted to significant features of modern physics with particular reference to the theory of surface forces as they influence the behaviour of soil colloids. Special attention will be given to the dynamics of soil moisture. A knowledge of elementary Physics and Mathematics will be essential as well as a good foundation in soils. Three credits. Winter, M. W. F. 8. *Gardner*

120, 121. Modern Physics. (Recommended for Juniors.) A study of electrons, ions, atomic structure and radiation. Three credits each quarter. Fall and Winter. Time arranged. *Hart*

130. Nuclear Physics. (To follow Physics 121.) A brief survey of methods and results of recent investigations of nuclear processes. Three credits. Spring. Time arranged. *Perry*

145, 146. Vector and Tensor Analysis. An introduction to vector and tensor analysis and their applications. Fall and Winter. Three credits each quarter. *Gardner*

153, 154. Analytical Mechanics. (To follow Physics 145.) Three credits each quarter. Winter and Spring, M. W. F. 9. *Gardner*

160. Heat. The nature, transmission, effects, and theories of heat. Three credits. Winter. Time arranged. *Perry*

161. Thermodynamics. A short introduction to thermodynamics. Three credits. Spring. Time arranged. *Perry*

166, 167. Geometrical and Physical Optics. Three credits each quarter. Winter and Spring. *Hart*

175, 176, 177. **Electricity and Magnetism.** A study of Electrostatics, Magnetostatics, D.C. and A.C. circuits, Electromagnetism, and Electromagnetic Theory. Three credits each quarter. Fall, Winter and Spring. Time arranged. *Perry*

182. **Electronics.** The concept of the electron, its relation to the structure of the atom, to the conduction of electricity, to ionization, to photoelectric and thermoelectric effects, etc. Emphasis will be placed on the design and construction of electronic measuring equipment for the modern research laboratory, for communication, and for the numerous controls in the modern factory. Three lectures; one lab. Four credits. *Cole*

190, 191, 192, (290, 291, 291). Theoretical Physics. Two or more credits each quarter. Fall, Winter, and Spring. Time arranged. *Gardner*

193, 194, 195, (293, 294, 295). Seminar in Physics. A weekly meeting of staff and Physics majors, consisting of reports on recent developments in Physics. Students may register and receive credit for course by making reports. One credit each quarter. Fall, Winter and Spring. Time arranged. *Staff*

250. Research in Physics. Time and credit to be arranged before registration. Any quarter. *Staff*

Upon sufficient demand, courses numbered 120-180 will be extended to cover more advanced work. Numbers will follow in consecutive order. Graduate credit may be given for certain extended courses taken by graduate students upon completion of extra work. In such cases the number will be the corresponding "200" number.

Speech

CHESTER J. MYERS, *Professor;* REX E. ROBINSON, *Associate Professor;* *FLOYD T. MORGAN, *Assistant Professor;* STUART HARDMAN, GWENDELLA THORNLEY, MR. ....., *Instructors.*

Forty-five credits of Speech are to be completed for the major. For prospective teachers, the distribution of these credits is to be as follows: courses in Public Speaking, 10 credits (Speech 25 or 125 required of all majors); courses in Interpretation, 10 credits (Speech 124 required of all majors); courses in Correction, 5 credits; courses in Dramatic Literature, 5 credits; courses in Play Production, 9 credits; elective courses in Speech, 6 credits. Students who do not intend to teach may apply for permission to substitute courses in their special fields of interest for some of those in this outline. A special major for students whose main interest for some of those in this outline. A special major for students whose main interest is Speech Correction may be outlined by consultation with the Head of the Speech Department.

All Speech Minors must complete at least 18 credits of Speech work. Courses to be taken will be determined in consultation with the Head of the Speech Department.

Speech 123 is recommended for those who are planning to teach Speech.

Composite English-Speech Major. Students whose major interests are divided between English, Journalism and Speech may take a composite English-Speech major. Such a major relieves the student of all requirements for a minor. This combination is recommended highly. Consult with the Head of the English Department and the Head of the Speech Department.

MASTER OF SCIENCE DEGREE

The Department of Speech offers opportunity for research and graduate study leading to a Master of Science degree in the following specialized fields: Speech science, interpretation, theatre, and public discussion.

*On leave.

The following courses of the 100 series may be modified and used for graduate credit by students majoring in the Speech Department, or by students in other departments: 107, 109, 110, 111, 123, 124, 125, 145, 150, 154, 171, 173, 183.

1. Public Speaking. (Formerly Fundamentals of Speech.) Elementary training in Public Speaking. Includes training in daily speaking situations, voice improvement. Clinic assistance available to students who need it. Time for clinical assistance to be arranged. Credit will not be given to students who have taken Speech 5. Five credits. Fall, Winter, Spring. Daily 8, 9, 10, 1. *Staff*

3. Advanced Public Speaking. Training in handling special and more complex speaking situations. Emphasis on developing skill in speech presentation. Prerequisite Speech 1 or 5. Three credits. Fall, Winter, Spring, Daily 10. *Robinson*

4. Principles of Reading. The principles of effective oral and silent reading. Emphasis on oral delivery of literary selections. A preparatory course for understanding and appreciation of the printed page. Practice material includes not only standard literature, but also everyday reading matter. Five credits. Fall, Winter, Spring, Daily 10. *Thornley*

5. Extempore Speech. Designed to meet the specific needs of professional people in the practice of their profession. Basic principles of effective speaking, with emhasis on preparation and delivery of forms of address of greatest interest to those for whom the course is rovided. Credit will not be given to students who have taken Speech 1. Three credits. Fall, M. W. F. 10; T. Th. 10; M. W. F. 1. Winter, M. W. F. 9; T. Th. F. 9; M W. F. 10; T. Th. F. 10. Spring, M. W. F. 9; T. Th. F. 9; M. W. F. 1. *Staff*

6. Introduction to the Theatre. An elementary study of the Theatre as a business, both professional and amateur. Work includes lecture, outside reading and class discussions. Two credits. Fall, T. Th. 1. *Hardman*

7. Basic Principles of Voice and Articulation. A training course, adapted to individual needs and abilities. Exercises for flexibility of voice, articulation, and pronunciation. Recommended for all Speech majors and minors, for prospective teachers, and all others whose individual needs cannot be met successfully in Speech 1 or other courses in public speaking and oral interpretation. Three credits. Fall, M. W. F. 9. *Staff*

8. Speech Foundations. This course is designed to give students orientation in the fields of speech and drama. It is hoped that through participation in this course students will broaden their outlook and develop a philosophy of speech and drama; that they will grow in the comprehension and appreciation of the persistent problems in the fields; that they will increase their information about the various phases of speech and drama; and that they will become more resourceful in locating the literature in the fields. Three credits. Winter, M. W. F. 1. *Partridge and Staff*

12 or 112. Private Instruction. Individual attention given in private to particular needs of the student in an effort to eliminate personal defects, develop skill, and solve individual speech problems. Recommended for anyone needing personal speech and to speech majors. Special fee. Any quarter. Time and credit arranged. May be taken more than one quarter. *Staff*

13 or 113. Argumentation. For the student desiring a background of information and practice in the techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and the construction and delivery of the argumentative speech. Students will present argumentative speeches, including class debates. Required of those wishing credit for Speech 15 or 115, Intercollegiate Debating. Three credits. Fall, M. W. F. 9. *Robinson*

15 or 115. Intercollegiate Debating. Members of the debating squads may receive not more than three credits in any one year. Credit will be granted only to those with credit in Speech 13 or 113, Argumentation. Fall, Winter, M. W. F. 2. *Robinson*

16. Dialect. A study of the most prominent dialect forms, their principles and uses. The dialect work of such writers as Burns, Kipling, Drummond, Riley, Dunbar, Harris, and Kirk will be studied, discussed and learned. Three credits. Spring, M. W. F. 11. *Myers*

18. Story Telling. The story as an educational factor, analysis and classification of typical stories with reference to each period of the child's development. Study of sources; adoption of material; and actual practice in story telling. Consideration is given to stories of western pioneer life. The work is designed to meet the needs of student, teacher, recreational leader, church activity leader, librarian, and parent. Five credits. Fall and Spring, Daily 10. *Myers*

20 or 120. Playground Dramatics and Pageantry—Designed for those interested in studying the principles involved in playground dramatics, make-up, pageantry, storytelling and related activities. Three credits. Winter, M. W. F. 11. *Myers*

22 or 122. Playwriting. An introductory study of dramatic composition. The work includes outside reading, class discussions, and the writing of a one act or longer play. Two credits. Spring, T. Th. 1. *Hardman*

24. Oral Interpretation. Intermediate course. One that puts into practice by means of platform reading, the principles studied in Speech 4. Various literary types are prepared for platform presentation. A more specialized and artistic course than Speech 4. Three credits. Fall, M. W. F. 11. *Myers*

25 or 125. Speech Composition. Advanced theory and practice of public speaking. Students will build and deliver several short speeches and will read selected masterpieces from the world's public speaking literature. Prerequisite: Sophomore Standing, and Speech 1 or 5. Five credits. Winter, Daily 9. *Robinson*

45. Acting: The One-Act Play. Elementary acting techniques and presentation of one-act plays. Winter, M. W. F. 2-4. Three credits. *Hardman*

English 47, 48, 49. (See English Department.)

60. Drama Appreciation. An introduction to the understanding and enjoyment of dramatic literature, radio drama, and moving pictures. Selected readings of dramatic masterpieces and other contributions to the theatre. Five credits. Winter, Daily 10. *Staff*

English 63, 163. (See English Department.)

65 or 165. Descriptive Phonetics. Required of speech correction majors and recommended for speech majors and minors. This course is designed to allow students to study the international phonetic alphabet so that it may be a tool in the study of articulation. Two credits. Fall, T. Th. 1. *Partridge*

81. Radio Speech. A study of speech in radio presentation. Radio programs made up of the various types of radio speaking—announcing, interview, round table, quiz, drama, folk, panel, newscasting, etc.—will be planned and presented. An effort will be made to broadcast quality work over the local radio station. Three credits. Fall and Spring, M. W. F. 2-4. *Staff*

107. Speech Hygiene. The techniques of normal speech and the development of normal and abnormal speech. Major consideration will be given to the prevention and correction of speech abnormalities. This course is primarily designed to fulfill the speech hygiene needs of elementary school teachers. It is recommended for all secondary teachers but will not fulfill the speech pathology requirement for Speech majors. Three credits. Fall, W. 4-6. *Partridge*

109. Public Discussion. Application of the various group discussion techniques to current problems. Efforts are made to have some of the discussions presented to various civic and religious organizations or to release them over a commercial radio station. Three credits. Spring, M. W. F. 9. *Robinson*

110. Public Programs. Types of interpretive material suitable for presentation before various kinds of audiences. Reading of short stories, plays, and novels to determine suitability. The cutting of literary types and material to suitable form and length for public reading. Three credits. Fall, M. W. F. 9. *Myers*

111. The Psychology of Speech. The principles of psychology which underlie speech. Problems to be considered includes the nature and origin of speech, emotion and speech, personality and speech, the development of speech and language in the child and the psychology of the audience. Three credits. Spring, M. W. F. 10. *Partridge*

123. Teaching of Speech. The methods and problems peculiar to the teaching of Speech. A study of the organization of courses and lesson plans is included. Students may register only with the permission of the instructor. Two credits. Fall, T. Th. 9. *Myers*

124. Advanced Interpretation. The mastering of significant selections from the great writers. The student grows in power to interpret permanent literature. Reading from manuscript and from memory. Five credits. Winter, Daily 10. *Myers*

145. Advanced Acting and Directing. Designed to equip the student with a working knowledge of the principles of directing or acting and to give practice in play directing and acting. Such principles and problems as characterization, composition, picturization, movement, emphasis, preparation of the manuscript, play selection, casting, rehearsal organization and procedure, etc., will be studied. Students of this course will direct students of Acting, Speech 45, in one-act plays. Three credits. Winter, M. W. F. 2-4. *Staff*

150a, 150b, 150c. Drama Production. Study and application of the materials and processes of play production. Scene design and construction, scene painting, lighting, costuming, management, advertising, etc., are studied and principles learned applied to production of plays. Students will be assigned to work on staffs and crews of College-Community Theatre and Workshop productions. Speech majors and minors should arrange to take all three quarters of this course during their Junior year. Fall, Winter and Spring, T. Th. 2-5. Two credits each quarter. *Hardman*

154. Children's Theatre. Creative dramatics for children. A course in educational dramatics for students who wish to prepare to direct children in dramatic work. A study will be made of plays suitable for primary and intermediate schools. Courses in dramatics will be outlined, stories dramatized and plays produced. The College Training School will afford opportunity for this work. Of special interest to prospective elementary school teachers. Consult instructor before registering. Three to five credits. Winter, 4-6. Lab. arranged. *Myers*

167. Introduction to Speech Correction. Required of all Speech and Speech Correction majors and those taking a composite Speech and English major. It is suggested as an elective for majors in Psychology. This course is the first course in speech correction, dealing with common speech defects and remedial measures for problems in lisping, indistinct pronunciation, foreign accent, delayed speech, stuttering, and inappropriate use of the voice. Five credits. Winter, Daily 9. *Partridge*

171. Speech Pathology. This is the advanced course in speech correction. It deals with the speech involvements of pathologies of the larynx, mouth, ears and brain. Disorders such as pathological voice defects, cleft palate, hard of hearing and deafness, aphasia, and spastic speech are given particular attention. Prerequisite, Speech 167. Three credits. Spring, M. W. F. 11. *Partridge*

173. Speech Clinic. Application and discussion of methods applied to speech correction in the clinic. Training and practice through the supervised handling of selected cases. Students who have had one quarter of experience are allowed to participate in extension clinics. Prerequisite or corequisite, Speech 167. Consult the instructor for permission to register. Any quarter. Time and credit arranged. *Partridge*

183. Problems in Speech and Theatre. Especially selected work, individually assigned, handled, and directed in consultation with the student. Special Speech problems of merit and of mutual interest to students and instructors are investigated and reported upon in this course. Consult the instructor for permission to register. Any quarter. Time and credit arranged. *Staff*

GRADUATE COURSES

200. Seminar in Speech. Emphasis on the various fields of speech. Research problems. Two credits. Fall, Winter. *Staff*

201. Thesis. Prerequisite: Graduate standing. Two to five credits. Fall, Winter, Spring. *Myers and Staff*

202. Seminar in Theatre. Prerequisite: Graduate standing. Two credits. Fall, Winter, Spring. *Morgan and Staff*

203. Seminar in Public Speaking. Prerequisite: Graduate standing. Two credits. Fall, Winter, Spring. *Robinson and Staff*

204. Seminar in Interpretation. Prerequisite: Graduate standing. Two credits. Fall, Winter, Spring. *Myers and Staff*

205. Seminar in Speech Science. Prerequisite: Graduate standing. Two credits. Fall, Winter, Spring. *Staff*

Zoology, Entomology and Physiology

Administered jointly by the School of Agriculture and the School of Arts and Sciences

D. M. HAMMOND, G. F. KNOWLTON, C. J. SORENSON, *Professors;* J. SEDLEY STANFORD, G. H. KELKER, CLYDE BIDDULPH, ..., *Associate Professors;* WILLIAM SCHOLES, *Assistant Professor;* MERRILL GUNNELL, *Instructor;* FRANK E. TODD, HOWARD E. DORST, F. V. LIEBERMAN, G. E. BOHART, H. F. THORNLEY, WALTER E. PEAY, S. J. SNOW, WILLIAM P. NYE, *Collaborators in Research, U. S. D. A.*

For a major in Zoology the following courses must be taken: Zoology 3, 4, 106, 109, 112, 116, 117, 118, 119, 124, 126, 131; Entomology 13. Students especially interested in the natural history phases of Zoology may make any or all of the following substitutions for a major in Zoology: 155 and 160 for 118, 121 or 122 for 117. Also the following courses are recommended: Mathematics 34, 35, 46, 111 or Agronomy 115; Chemistry 3, 4, 5, 121, 122; Physics 21, 22, 23; Botany 21, 22, 23; Bacteriology 1, 2; Geology 1, 2. For students planning to do post graduate work leading toward the Ph. D. degree, at least one year of French or German is also recommended.

For a pre-medical major in Zoology, the pre-medical requirements listed in the introduction to the School of Arts and Sciences must be completed, and in addition the following courses must be taken: Zoology 12, 116, 119, 124, 126, 131; Entomology 115.

MASTER OF SCIENCE DEGREE

The Zoology, Entomology, and Physiology Department offers work toward the Master of Science degree in various phases of agricultural entomology, medical entomology, physiology, taxonomy, parasitology, mammalogy, and ornithology.

The following Senior College courses are acceptable for graduate credit for Master of Science Degree candidates in the Department:

Zoology 107, 116, 118, 131

Entomology 103, 104, 109, 130, 131, 133, 156

Physiology 121, 122, 123, 180

The following Senior College courses may be used for graduate credit by students majoring in other departments:

Zoology 107, 112, 115, 116, 117, 118, 121

Entomology 101, 103, 104, 108, 109, 115, 138, 156

Physiology 121, 122, 123, 160, 180

1. Principles of Biology. A fundamental course in the basic life principles as illustrated in both plant and animal forms. Special attention will be given to the nature and structure of protoplasm, differentiation in plant and animal cells, adaption, reproduction and development, basic metabolic processes, heredity and evolution, types and phylogenetic relationships as exhibited in the major groups of plants and animals. For junior college students, except those who may elect Botany 21, 22 and 23, or Zoology 2 or 3 and 4. Five credits. Fall, Winter, Spring. Daily 10. *Staff*

2. General Zoology. A brief survey of the more important groups of animals, including the organization, behavior, reproduction, classification and relationships of each group. The basic principles of greatest importance in the field of Zoology will receive some consideration. This course is especially designed to meet the needs of students in the schools of Agriculture and Forestry for a basic course in Zoology. Five credits, Fall, Winter, M. W. F. 11; Lab., T. Th. 2-5. *Stanford*

3. Invertebrate Zoology. This course is an introduction to the invertebrate animals. Classification and relationships, structural characters, development and functions are emphasized. Some attention is also given to parasitism. This course is well adapted for premedical students, Forestry (Wildlife) majors, and others who desire a comprehensive introduction to the animal kingdom. Five credits. Fall, M. W. F. 9; Lab., M. W. 2-5; Winter, M. W. F. 10; Lab., T. Th. 2-5. *Stanford*

4. Vertebrate Zoology. The same general plan as given in course 3 is followed in the study of the vertebrates. Some attention is given to the local fauna. Five credits. Winter, Spring, M. W. F. 9; Lab., M. W. 2-5. *Stanford*

106. Zoological Literature. The literature and bibliographies of zoology and entomology are studied. Each student is assigned, or may choose, a report on the literature of some insect or other animal, Prerequisite, two or more of the fundamental courses required of department majors. One lecture and one lab. Two credits. Spring, M. 11, one hour arranged. *Stanford*

107. History of Biology. The study of the more important men and ideas in the historical development of biology with especial reference to the zoological sciences. Two credits. Fall, time arranged. *Staff*

111. Heredity. The facts and principles of inheritance, with emphasis on application to human beings. This includes a consideration of how characteristics are passed from parent to offspring, how the most important human characteristics are inherited, and how the human race as a whole is being influenced in its inherited qualities by various agencies and conditions. It is desirable but not essential that an introductory course in biology, physiology, zoology, or botany precede this course. Four credits. Fall or Spring, M. T. W. Th. 1. *Staff*

112. Principles of Genetics. A technical course in the basic principles underlying heredity and variation, and their application to the problems of plant and animal breeding, and human inheritance. Prerequisite, Zoology 2, or 3 and 4, or Botany 21, 22 and 23. Five credits. Fall, Winter, M. T. W. Th. 10; Lab., Sec. 1, Th. 2-5; Sec. 2, F. 2-5. *Staff*

116. Parasitology. The protozoa and worms parasitic in man, domestic animals and wild animals, and the relationships between the parasites and their hosts. Some consideration is given to the free-living relatives of the parasites. Forms occurring in this general region are emphasized. Prerequisite: Zool. 3. Five credits. Spring, M. W. F. 11; Lab., M. W. 2-5. *Hammond*

117. Methods and Elements of Animal Histology. An introduction to the techniques employed in making preparations of animal tissues for microscopic study, and a consideration of the structural characteristics of the tissues and principal organs in representatives of the groups of animals, especially vertebrates. Four credits. Fall, T. Th. 9; Lab., T. Th. 2-5. *Hammond*

118. Vertebrate Embryology. An introduction to the principles of development of the vertebrates, including the formation of gametes, fertilization, cleavage, gastrulation, formation of germ layers, establishment of body form, and organogenesis. In the laboratory the development of the frog, chick and pig is studied. Required of premedical students. Prerequisite: Zoo. 4 or equivalent. Five credits. Winter, M. W. F. 10; Lab., T. Th. 2-5. *Hammond*

119. Comparative Anatomy. A study of the fundamentals of structure of the vertebrate body. The anatomy of typical representatives of each class of vertebrates and the organic systems from the simplest to the most complex forms are studied on a comparative basis. In the laboratory, the shark and the cat are thoroughly dissected. This course provides useful training for premedical as well as Zoology majors. Prerequisite: Zoo. 4 or equivalent. Four credits. Spring, T. Th. 9; Lab., T. Th. 2-5. *Hammond*

121. Ornithology. A course in bird study planned to acquaint the students with our native birds and with the class Aves (birds) in general. Identification, relationships, structure, habits, and distribution will be studied in classroom, laboratory, and field. Four credits. Spring, T. Th. 9; Lab., T. Th. 10-12. *Stanford*

122. Mammalogy. This course is designed to introduce the students to the large and very important class, Mammalia, with particular reference to Utah and North American species. Identification, distribution, structure, habits, and economic importance will be stressed. Four credits. Winter, T. Th. 9; Lab., T. Th. 10-12. *Stanford*

123. Nature Study of Birds. Teachers and other students of nature can find in this course an opportunity to learn the names, habits, songs, foods and distribution of the more common birds of Utah. Attention is also given to prominent birds of other states and continents. Laboratory and field trips arranged. Three credits. Spring, T. Th. 1. *Stanford*

124, 126. Seminar. The students and the faculty of the department meet for one hour each week and hear reports from the members of the seminar on topics of mutual interest. Students majoring in the department must attend and participate in the activities of this seminar for at least two quarters. One credit each quarter. Fall and Spring. Time arranged. *Staff*

131 or 231. Organic Evolution. A critical study of the facts of evolution as obtained from a careful study of comparative anatomy, embryology, geographical distribution, blood tests, and other fields upon which the doctrine of evolution is based. Factors causing evolution will be considered and discussions will be undertaken on other bodies of related thought. Prerequisite, some thorough course in Biology. Three credits. Spring, M. W. F. 8. *Staff*

155. Ichthyology. Ecology, classification, and life histories of native and introduced fishes. Two lectures. One laboratory. Field trips. Three credits. Fall, T. Th. 9; Lab., Th. 2-5. *Kelker*

160. Animal Ecology. Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships of biotic communities. Additional assignment to graduate students. Three credits. Spring, M. 10; Lab., M. Th. 2-5. *Kelker*

199. Minor Problems. A course dealing with research problems similar to Zoo. 201, but intended primarily for undergraduate majors in Zoology. Any quarter. Time and credit arranged. *Staff*

201. Special Problems. The student who wishes to engage in some line of original research and is qualified to do so may elect and study some topic in the field of Zoology. Open to undergraduates only by special arrangement with the department. Thesis required. Any quarter. Time and credit arranged. *Staff*

205. Methods of Research. For students doing or intending to do original work in some line of Zoology or Entomology, this course offers instruction in selection of topics for research, organization of attack upon problems, methods of finding previously published work, outlining the problem, illustration of the thesis, etc. Required of graduate students who are working for a Master's degree in the department. One credit. Winter, Time arranged. *Staff*

217. Advanced Histological Technique. A continuation of Zoology 117 for graduate students, and for students who wish a more thorough and extensive training in the techniques of preparation of biological materials for study. Additional technique such as the celloidin method, freezing method, embalming and injection of specimens, etc., will be undertaken. Prerequisite: Zoo. 117. Two credits. Spring, M. 2-5, one Lab. arranged or time arranged with the permission of the instructor. *Staff*

240. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Any quarter. Time and credit arranged. *Staff*

ENTOMOLOGY

For a major in Entomology the following courses are required: Zoology 3, 4, 12, 106, 107; Entomology 13, 101, 102, 103, 108, 115, 125, 126, 156. The following courses are recommended: Mathematics 34, 35, 46, 111 or Agronomy 115; Chemistry 3, 4, 5, 121, 122; Physics 21, 22, 23; Botany 21, 22, 23, 130; and one basic course in each of the following fields: Agronomy, Horticulture and Vegetable Crops. For students who are planning to do postgraduate work leading toward the Ph.D. degree, at least one year of French or German is also recommended.

For a major in Agricultural Entomology see Department of Zoology, Entomology and Physiology, in School of Agriculture.

13. General Entomology. The structure, classification, interrelationships, and life histories of insects are studied. Some field trips are taken. This is a fundamental course and is required of all department majors. Five credits. Fall, M. W. F. 8; Lab., T. Th. 2-5. *Stanford*

101. Insect Morphology. Comparative study of insect anatomy with emphasis placed on the structures used in taxonomy. Prerequisite, Ent. 13. Required for Ent. 103, and 104. Four credits. Two laboratory periods, time arranged. Winter, M. W. 11. *Stanford*

102. Systematic Entomology. Ent. 101 is prerequisite. Each student must collect, properly mount, and label a representative collection of insects. The collection must contain at least 350 specimens, at least 125 species, and at least 15 orders. The whole collection must be arranged in phylogenetic sequence. Classification will include a correct placing of all specimens in orders. To be taken only with the permission of the instructor. Three laboratory periods. Three credits. Any quarter. Time arranged. *Knowlton*

103 or 203. Systematic Entomology. Continuation of Ent. 102. The collection arranged for Ent. 102 must be enlarged to at least 700 specimens, 225 species, 100 families, and 18 orders. Classification will include a correct placing of all specimens in families. To be taken only with the permission of the instructor. Three laboratory periods. Three credits. Any quarter. Time arranged. *Knowlton*

104 or 204. Systematic Entomology. Continuation of Ent. 103. Permission to take this course depends on the student's collection for Ent. 102 and 103. If his collection justifies further study, he may select one or two orders of insects and classify them to species. To be taken only with the permission of the instructor. Three laboratory periods. Three credits. Any quarter. Time arranged. *Knowlton*

105. Forest Entomology. A study of the principal insects attacking forests and forest products. Some attention is also given to the principles of biological control. A brief study is made of forest vertebrates with emphasis on insect-eating birds. Three credits. Fall, T. 9; Lab., T. Th. 10-1. *Stanford*

108. Agricultural Entomology. Studies pertaining to insect pests of major economic importance to agriculture in Utah and the West, including their recognition, type of damage inflicted, distribution, life history, and methods of control. Insecticides, together with practical methods and timing of their application, are considered. This course is primarily for Senior College students. Five credits. Spring, M. W. F. 8; Lab., Sec. 1, T. Th. 2-5; Sec. 2, W. F. 2-5. *Sorenson*

109 or 209. Advanced Economic Entomology. This course deals with recognition and control of important insect pests by physical, cultural, biological, mechanical, chemical, and quarantine methods. Prerequisite: Ent. 108. Five credits. Winter, M. W. F. 10; Lab., T. Th. 2-5. *Knowlton*

115. Medical and Veterinary Entomology. The study of those Arthropods that annoy and transmit disease to man and domesticated and wild animals. Vectors of plague, spotted fever, tularemia, malaria and other Arthropods carrying disease will receive major attention. Prerequisite, Ent. 13 or equivalent. Four credits. Winter, T. Th. 8; Lab., T. Th. 2-5. *Stanford*

125, 126. Seminar. Students are assigned subjects upon which they report to the group. In the winter quarter entomological subjects are assigned; in the spring quarter subjects fundamental to both entomology and zoology. Chiefly for major students. One credit each quarter. Winter and Spring. Time arranged. *Staff*

138. Aquatic Entomology. Identification, distribution, life histories and adaptations of aquatic insects will be studied with particular reference to our local streams and lakes. Three credits. Two lectures, one Lab. Spring, M. W. 1; Lab., M. or W. 2-5. *Stanford*

156 or 256. Chemistry of Insecticides and Fungicides. For course description see Chemistry 156 or 256. Two credits. Winter. *Hill*

160. Animal Ecology. (See Zoology 160.)

199. Minor Problems in Entomology. A course dealing with research problems similar to Ent. 210, but intended primarily for advanced undergraduate majors in Entomology. Any quarter. Time and credit arranged. *Staff*

210. Special Problems. Students may select or will be assigned problems dealing with certain phases of Entomology. The amount of credit will depend on the nature of the problem and the time spent. Thesis required. Open to undergraduate students only by special permission. Prerequisites: Ent. 13, 103 and 108. Any quarter. Time and credit arranged. *Staff*

230. Insects in Relation to Plant Diseases. A study of the important insect vectors of plant disease, their habits, modes of transmission and dissemination of diseases. Rearing and handling methods, equipment and techniques will be considered. Prerequisite: Ent. 13 or 108. Three credits, or four credits with laboratory. Fall, M. W. F. 9; Lab. arranged. *Sorenson*

231. Biological Control of Insect Pests. Biological agents in insect control. Invertebrate parasites and predators, vertebrate predators, and diseases will receive consideration as they relate to supression or control of insect pests. Three credits. Winter, M. W. F. 1. *Knowlton*

233. Introduction to Aphidology. Morphology, biology and taxonomy of aphids will be studied. Prerequisite: Ent. 102. Two credits. Winter, T. Th. 12-2. *Knowlton*

234. Readings in Entomology. Assigned readings of advanced nature. Any quarter. Time and credit arranged. *Staff*

250. Research and Thesis. For research connected with problem undertaken for partial fulfillment of requirements for Master of Science degree. Any quarter. Time and credit arranged. *Staff*

PHYSIOLOGY

For a major in Physiology the following courses must be taken: Physiology 4, 10, 115 or 116 or 117, 121, 122, 123, 180, 195. Also Mathematics 34, 35 and 46; Physics 20, 21 and 22; Chemistry 3, 4, 5, 121, 122; Biochemistry; Zoology 1, 3, 4, 117, 118, 119 and 131, and Bacteriology 70, are recommended.

4. General Physiology. For the student who desires a survey of physiology and who is not planning on advanced intensive study in the field. It deals with the functioning of the human body with emphasis upon broad general biological principles. Five credits. Fall, Daily 8, 9, 10, 2; Winter, Daily 8, 9, 10, 2; Spring, Daily 8, 9, 10. *Staff*

10. Human Anatomy. A general study of the anatomy of the human body including the cell, tissues, organs, and systems. Prerequisite: Physiology 4. Five credits. Winter, Daily 8. *Scholes*

104. Kinesiology. A study of articulations and muscles with an analysis of movements and actions. The skeleton, manikin and man himself will afford the laboratory material. Three credits. Fall, M. W. F. 10. *Staff*

115, 116, 117. Current Literature in Physiology. Current literature in physiology with oral and written reports. One credit each quarter. Time arranged. *Biddulph*

121, 122. Physiology. A two-quarter course designed for students desiring an intensive and detailed study of physiology. The function of each of the organ systems of man and animals is studied. Unless special permission is granted, students may not register for the second quarter without having had the first quarter. As preparation, Physiology 4, or Zoology 2, 3, or 4, or Veterinary Science 20, and a course in physics and chemistry are recommended. Five credits each quarter. Fall, M. W. F. 9, Lab., M. W. 2-5; Winter, M. W. F. 9, Lab., M. W. 2-5. *Biddulph*

123. Endocrinology. The glands of internal secretion are studied, special emphasis being placed on the hormones in reproduction. As preparation, Physiology 4 or Zoology 1, 2, 3 or 4, or Veterinary Science 20 are recommended. Three credits. Spring, M. W. F. 9. *Biddulph*

160, 260. Physiology Research. Special investigations in physiology are carried out in this laboratory course. Open to students who have taken Physiology 121, 122 or who have been granted special permission. Two to five credits. Any quarter. Time arranged. *Biddulph*

180, 280. Advanced Physiological Hygiene. Special problems in hygiene are considered. Previous work in physiology and hygiene are recommended as preparation. Three credits. Spring, M. W. F. 1. *Scholes*

195, 295. Physiology Seminar. One credit. Spring, T. 1. *Staff*

SCHOOL OF COMMERCE

W. L. WANLASS, *Dean*

General Information

THE purpose of the School of Commerce is to give opportunity for a liberal education with special emphasis upon the commercial, social and political phases of life. Persons who complete the courses offered in this School are prepared to assume leadership and responsibility in business and in various industries and professions. In order to meet the growing demand and to keep pace with recent tendencies in education, students may major in Accounting, Business Administration, Merchandising, Secretarial Science, Economics, Political Science, Sociology, Agricultural Economics and Marketing.

For the professions of law and medicine some of these subjects such as Economics or Political Science afford excellent preparation. Graduates are prepared for positions as teachers in high school. Many desirable positions as industrial managers are open to those who are qualified by training and experience. Many students who are especially qualified find employment in the field of retail and wholesale merchandising.

Special attention is called to the many opportunities for service in sociological and governmental work. (See Training for Government Service.) The Departments of Political Science and Sociology offer basic and professional courses in these fields.

For requirements for admission, certification, and graduation see pages 43 to 51.

NOTE: All students in the School of Commerce are urged to take Textiles and Clothing 15 and Principles of Nutrition 5, School of Home Economics.

Pre-Legal Training

Students who plan to go into the profession of Law may pursue a course of study, primarily in the School of Commerce, that will not only enable them to meet all entrance requirements in any American law school, but will also form an excellent foundation for the study of law.

Some law schools admit only college graduates. Others admit students on the basis of three years of college training. College graduation is desirable even where it is not required for admission.

Prospective law students may major in any department in the School of Commerce, but not less than fifteen credit hours of work should be done in each of the following fields: Accounting, Economics, Political Science, Sociology, History and English, in addition to meeting the requirements for graduation in the Major Department.

All pre-legal students should consult Professor M. R. Merrill.

Training for Government Service

The Federal Government during recent years has employed increasing numbers of College-trained men and women who are qualified for service in its various departments. In all probability this expansion of government activity will continue for several years. In suggesting the following courses the School of Commerce has attempted to indicate lines of study which will be helpful in preparing for government service. With slight modification, these courses will serve equally well to qualify the student for desirable positions outside the field of government service, as the basic requirements in both fields are similar.

Suggested Courses

I. **Accounting:** Accounting 1, 2, 29, 101, 102, 103, 105, 11, 120, 121, 127; Political Science 129.

II. **Land Economics:** Economics 28, Economics 51, 52 or Agricultural Economics 53a, b; Agronomy 6; Political Science 1, 10 and 129; Business Administration 141; Agricultural Engineering 10; Geology 3.

In addition the student should satisfy the requirements for a major in Agricultural Economics.

III. **Marketing:** Economics 28, 51, 52; Mathematics 30, 60, 111.
Agricultural Economics:

The student should satisfy the requirement for a major in this department.

In addition a thorough preparation should be made in the special fields in which it is desired to work such as wool, dairying, etc.

IV. **Consular and Diplomatic Service:** Political Science 10, 11, 12, 12, 101, 102, 104, 105, 106, 107, 129; Foreign Language, German, French, or Spanish, depending upon the location desired; English 10 or 11, 112; Economics 51, 52, 140.

V. **General Administrative Training:**

It is felt that anyone contemplating government service should have an intimate knowledge of the workings of our government and its relationship to industry. To supply that need the following courses are suggested: Political Science, 10a, 103, 129; or 140 or 145, 200; Economics 125, 147.

VI. **Statistics:** Mathematics 30, 35, 60 and 111; Economics 28, 51, 52, 131, 132.

VII. **Secretarial Science:** Secretarial Science 30, 65, 80, 81, 82, 89, 90, 91, 94, 98, 175, 183, 184, 186, 187; Business Administration 1, 2, 25, 101, 135, 136; Economics 51, 52, 140; Political Science 10, 129; Sociology 70.

VIII. **Sociology:**

For Case Work:

Psychology 102a, 102b, 103a and 103b, 110.
Child Development 140.
Physiology 160, 180.
Sociology 52, 70, 102, 140, 162, 170, 172, 220.

For Social Research:

Mathematics 34, 35 and 111.
Sociology 70, 202, 220.
Thirty hours of factual courses in the Department.

Field Work under supervision.

IX. **Economics:** Mathematics 30, 34, 60, 111; Economics 27, 28, 51, 131; Sociology 70. And the courses listed for those majoring in Economics.

Agricultural Economics and Marketing

Administered jointly by the School of Agriculture and the School of Commerce

W. P. THOMAS, G. T. BLANCH, *Professors;* DEE A. BROADBENT*, G. A. CARPENTER, *Associate Professors;* E. M. MORRISON, *Assistant Professor;* M. H. TAYLOR, *Farm Labor Supervisor;* H. R. HOCHMUTH, *Collaborator in Research.*

Students majoring in the Department of Agricultural Economics and Marketing may be graduated from either the School of Agriculture or the School of Commerce. The choice of school should be determined by the field in which the student intends to do his minor work.

Those graduating from the School of Agriculture must satisfy requirements for graduation from that School in addition to other courses prescribed by the major professor. Those graduating from the School of Commerce must, in addition to satisfying the requirements for graduation from the school, include certain basic agricultural courses to be prescribed by the major professor.

In order to meet the requirements of students who plan to do graduate work or to enter into a field of employment where technical training is required, a special course has been provided for such students majoring in agricultural economics. Students satisfying requirements as prescribed for this course may graduate from either the School of Agriculture or Commerce. A schedule for this prescribed course may be obtained from the office of the Department of Agricultural Economics.

Master of Science Degree. The Department af Agricultural Economics offers opportunity for research and graduate study leading to a Master of Science Degree. The research facilities of the Department for training of graduate students are greatly augmented by the investigations conducted in the field of agricultural economics by the Department staff with the assistance of graduate students. The following courses of the 100 series may be used for graduate credit by students majoring in the department of Agricultural Economics: 102, 105, 106, 113a, 113b, 114, 116, 120, 121. For graduate students in other departments the following courses in the 100 series may be used for graduate credit: 102, 104, 105, 106, 113a, 113b, 110, 114, 116, 120.

See Agricultural Economics and Marketing in School of Agriculture for course listing.

Business Administration

(Including Accounting and Merchandising)

P. E. PETERSON, *Professor Emeritus;* V. D. GARDNER, W. L. WANLASS, *Professors;* L. MARK NEUBERGER, *Associate Professor;* INA DOTY, CLARA P. WEST, RUSSELL M. BATE, NORMAN S. CANNON, *Assistant Professors.*

Students majoring in Business Administration and Accounting may concentrate in the fields of Accounting, Finance, Management, Merchandising, and Secretarial Science. Students are advised to select from the courses listed below to complete their major and technical subjects according to their field of concentration. (Students majoring in Secretarial Science should register under the advice of the Instructional Staff for Secretarial Science.)

*On leave.

CREDIT TOWARD MASTER OF SCIENCE DEGREE

With the approval of heads of related departments in which students are candidates for the Master of Science degree, Courses No. 101 or above in the Department of Business Administration and Secretarial Science are acceptable for graduate credit.

RECOMMENDED COURSES FOR MAJOR AND SPECIAL GROUPS IN BUSINESS ADMINISTRATION

Freshman Year

Dpt.	No.	TITLE OF COURSE	Accounting	Finance	Bus. Adm.	Merchandising
B.A.	1–2	Int. Accounting	10*	10*	10*	10*
B.A.	63	Salesmanship	—	—	3	3
Econ.	51	General Economics	5*	5*	5*	5*
Econ.	27	Economic Dev. of U. S.	3	3	3	3
Econ.	28	Economic Geography of World	3	3	3	3
Psy.	3	Psychology	5	5	5*	5*
B.A.	20	Problems of Small Business	—	—	5*	5*
Soc.	70	Principles of Sociology	—	—	5*	—

Sophomore Year

Dpt.	No.	TITLE OF COURSE	Accounting	Finance	Bus. Adm.	Merchandising
B.A.	25	Int. Business Administration	5*	5*	5*	5*
B.A.	59	Blue Print Reading and Ind. Draw.	3*	3*	3*	3*
B.A.	62	Int. Marketing	5	5	5*	5*
B.A.	28	Int. Business Finance	5*	5*	5*	5*
B.A.	55	Int. Personal Administration	—	—	3*	3*
Econ.	52	Advanced General Economics	5*	5*	5*	5*
Math.	34	Algebra	3*	3*	3*	3*
Math.	30	Math. 30 for Bus. & Acct. Students	3*	3*	3*	3*
Math.	60	Math. of Investment	3*	3*	3*	3*
Psych.	54	Psychology of Business	3	3	3*	3*
P.S.	11-12-13	Commercial Law	9*	9	9	9

Junior Year

Dpt.	No.	TITLE OF COURSE	Accounting	Finance	Bus. Adm.	Merchandising
B.A.	101–2–3	Problems in Acctg. Principles	9*	9*	9*	9*
Econ.	125	Labor Problems	—	—	3*	—
Math.	111	Elementary Stat. Methods	5*	5*	5*	5*
B.A.	129	Government Accounting	3*	3	—	3
B.A.	140	Insurance	3	3	3	3
Soc.	140	Social Psychology	—	—	3*	—
B.A.	141	Real Estate	—	3*	3	3
Econ.	147	Social Security	—	—	3*	—
B.A.	151–2–3	Prob. in Merchandising	—	—	9*	9*
B.A.	156	Principles and Probl. of Advt.	—	—	5	5*
B.A.	161–2–3	Problems in Retail Distribution	—	—	9	9
Econ.	145	Economics of Consumption	—	—	2	2
Econ.	165	Money and Credit	3*	3*	3*	3*
Econ.	166	Banking	3	3*	3	3
P.S.	104–5–6	Commercial Law	9*	9*	9*	9*

*Urgently recommended.

Senior Year

Dpt.	No.	TITLE OF COURSE	Accounting	Finance	Bus. Adm.	Merchandising
B.A.	105–6 7	C-PA Problems	6*			
B.A.	111	Cost Accounting	5*	5	5	5
B.A.	120–21–22	Auditing Principles	9*	9		
B.A.	124–5–6	Accounting Seminar	3*			
B.A.	127a–b	Income Tax Accounting	6*			
B.A.	130	Investments	5	5*	5	
Econ.	131–2	Business Statistics	6*	6*	6*	6*
B.A.	133	Industrial Management	5	5*	5*	5*
B.A.	134	Interpretation of Fin. State	5*	5*		
B.A.	135–6	Budgets	6*	6*	6*	6*
B.A.	137	Business Ethics	2	2	2	2
B.A.	149	Business Policy	5	5*	5*	5*
B.A.	154	Industrial Purchasing			4*	4*
B.A.	160	Sales Management			3	3
B.A.	164	Credit Administration	4*	4*	4*	4*
Sec.Sc.	175	Office Management	3*	3*	3*	3
Econ.	107a–b	Advanced Economics	6*	6*	6*	6*
Econ.	171	Economics of Business Cycles	3*	3*	3*	3*
P.S.	107–8	Commercial Law	6*	6*	6*	6*

Note: Inasmuch as some of the above courses are taught only every other year, the sudent is not required to take the courses in the year indicated. However, the general outline should be followed whenever possible.

Special Offerings for Returning Veterans Who Are Not Candidates for Degrees

For capable, mature persons whose education has been interrupted by the war and who want maximum professional training in a minimum of time, two two-year courses in addition to the one in Secretarial Science have been organized in the School of Commerce. These courses minimize liberal course offerings and concentrate upon vocational and professional courses. One gives training in merchandising and the other in accounting. Only those students who know definitely that they will not seek a degree should pursue these courses and then only after consultations with the head of the department. A special course in problems of small business is included.

ACCOUNTING

1, 2. Introductory Accounting. The purpose of this course is to present the basic principles of accounting in the form of lectures, questions, problems and practice sets which require application of the theory advanced. Principles and techniques learned here will be useful as a basis for further study of accounting and as an aid in the understanding of the more common problems of business. Technique will be emphasized. Five credits each quarter. B.A. 1 Fall, M. W. F. 10; M. W. F. 2; Lab., T. Th. 2-5; Winter, M. W. F. 10; M. W. F. 11; Lab. T. Th. 2-5; B.A. 2, Winter, M. W. F. 2; Lab., T. Th. 2-5; Spring M. W. F. 2; Lab., T. Th. 2-5. *Cannon, Bate*

Burrough's Calculator. (See Secretarial Science 94.)

Commercial and Bank Posting. (See Secretarial Science 98.)

Mathematics for Business and Accounting Students. (See Math. 30.)

Mathematics of Investment. (See Math. 60.)

100. Accounting for Non-Commercial Students. A brief course in Accounting to meet the needs of students in the School of Engineering, School of Agriculture, School of Home Economics, School of Forestry, and other non-Commercial students. Three credits. Fall, M. W. F. 10; Winter, M. W. F. 8. *Gardner*

*Urgently recommended.

100L. Accounting for Non-commercial Students. Laboratory optional for those taking accounting 100. Recommended where possible. One credit. Fall, W. 3-5; Winter, W. 3-5. *Gardner*

101, 102, 103. Problems in Accounting Principles. A basic course in the fundamental technique and principles of accounting. To acquire a working knowledge of accounting as it serves the business executive is the primary aim of this course. It should prove a valuable study not only to those students who aspire to a career in accounting, but also to teachers, lawyers, engineers and farmers. Interpretation and use of accounting as a tool of management is emphasized. Since facility in analysis can be acquired only through abundant practice, a variety of problems and home assignments will be provided. Graduate credit may be allowed upon the completion of some additional work. Four credits each quarter. Fall, Winter and Spring, M. W. F. 11; Lab., T. 3-5. *Gardner*

105, 106, 107. C.P-A Problems. Selected problems from professional examinations of various states. Two credits each quarter. F. W. S. (Not given 1947-48.)

111. Industrial Cost Accounting. Process cost accounting, standard costs, estimating cost systems, distribution costs, special considerations. Five credits. Winter, Daily 2. *Gardner*

120, 121, 122. Auditing Theory and Practice. A study of auditing principles and procedures. It is the aim of this course to give the student a practical knowledge of auditing. Prerequisites: A good working knowledge of accounting principles and techniques. Three credits each quarter. Fall, Winter and Spring, M. W. F. 10. *Peterson*

124, 125, 126. Accounting Seminar. Two credits each quarter. Th. 10. *Cannon*

127a, 127b. Income Tax Accounting. A careful study will be made of current Federal and State Income Tax Laws. Practical problems in the preparation of Income tax returns will be given. Three credits each quarter. Fall, Winter, M. W. F. 8. *Cannon*

129. Governmental Accounting. A study of the basic principles underlying the treatment of public and governmental accounts. Typical topics for study are: Statutory funds, budgets, trust funds, and preparation of financial reports. Three credits. Fall. (Not given 1947-48.)

BUSINESS ADMINISTRATION

Lettering and Commercial Art. (See Art 110.)

20. Problems of Small Business. A general survey of the problems encountered in starting a small business will be made. Consideration is given problems encountered before operations are started, such as selecting the right type of business, form of business, permits, licenses, choosing a location, credit and financing. In addition, the problems and details of actual operating procedures such as accounting controls, insurance, taxes, buying and selling will be considered in relation to various types of small business operations. Designed to aid the man just entering business. Five credits. Fall quarter, Daily8; Winter quarter, Daily 8. *Bate*

25. Introductory Business Administration. An introductory course in the fundamentals of business administration. It is intended that this course shall furnish the student with a background for the study of the more complex problems of business. Not open to freshmen. Lectures and reports. Five credits. Fall, Daily 9. *Neuberger*

28. Business Finance. This course treats of the structure of the corporate enterprise; providing for a new company; expansion of existing companies; recapitalization and reorganization of the corporation. Financial and operating ratios will be discussed. Proper financial plans and methods of marketing securities will also be considered. Open to qualified sophomores. Prerequisites: Econ. 51, 52, or equivalent, B.A. 1, 2. Five credits. Spring, Daily 8. *Gardner*

30M. Business Mathematics. For students in Business Administration. Three credits. Fall, M. W. F. 2; Winter, M. W. F. 9. *West*

Business Communications. See Secretarial Science 30.)

Commercial Art and Posters. (See Art 31.)

Color. (See Art 32.)

Psychology of Business and Industry. (See Psychology 54.)

55. Introduction to Personnel Administration. A critical analysis of the problems of labor management which confront the manager of a business enterprise and of policies and methods of dealing effectively with these problems. Three credits. Spring, M. W. F. 9. *Neuberger*

B.A. 59. Blueprint Reading and Industrial Drawing. (See Civil Engineering 59. Required of all majors in business administration.)

Mathematics of Investment. (See Math. 60.) Urged for all accounting and business administration majors.

Indexing and Filing. (See Secretarial Science 65.)

Elementary Statistical Methods. (See Math. 110 or 111.) Recommended for accounting and business administration majors.

Labor Problems. (See Economics 125.) Required of all business administration majors.

130. Problems in Investment. With concrete cases used as a basis of discussion, the varying investment needs of different classes of people are studied in the first part of the course. In the second part, attention is given to different types of investment houses. In the third, types of investment securities are analyzed. Five credits. Winter, Daily 9. (Not given 1947-48.)

Business Statistics. (See Economics 131, 132.) Required of all business administration majors.

133. Industrial Management Problems. Selected cases will be taken up for study and report. Problems in industrial location; on choice of site; on buildings and layouts; on selection, purchase, and arrangement of equipment; on purchas- and stores; on organization; on industrial research; on labor relations and on problems in managerial control. Prerequisite: B.A. 25 or B.A. 20. Five credits. Fall, Daily 8. *Gardner*

134. Interpretation of Financial Statements. This course aims to give experience in the use of accounting data for evaluating management, and determing the conditions of enterprises in which one may become interested. The course will cover: (1) the interpretation of balance sheets, of operating statements, and the changes between successive statements; (2) the validity of the accounting principles according to which the available information was compiled; (3) the adequacy of the information furnished as a basis for proper judgment of the enterprise; and (4) the financial and managerial significance of the data of special interest to investors, public and private accountants, credit men and teachers. Three credits. Spring, M. W. F. 11. *Cannon*

135, 136. Budgets. The organization and practical application of the budget in modern business. Particular emphasis is given the managerial aspects of budgets saan instrument of control. Practical problems in the formulation and execution of business budgets are provided. Three credits each quarter. 135 in Winter and Spring, M. W. F. 9; 136 in Fall for students who have completed 135. *Peterson*

137. Business and Professional Ethics. After a general survey of the science of ethics, special consideration will be given to those principles of professional conduct which are rapidly being introduced into modern business. The work of trade associations and professional organizations will be critically analyzed. Three credits. Winter, M. W. F. 9. *Wanlass*

Risk and Risk Bearing. (See Economics 139.)

140. Insurance. Studied primarily from the standpoint of the consumer of insurance services. Among the topics treated are: types of life and property insuranc contracts, nature and uses of life and property insurance, life insurance as an investment, and the organization, management and government supervision over insurance companies. Attention will also be given to the findings of the Temporary National Economic Committee in its study of the life insurance industry. Three credits. *Staff*

Social Psychology. (See Sociology 140.) Required of all business administration majors.

141. Real Estate. This course is designed for those who will be considering the purchase of real estate and of securities based upon real estate, and as an introduction to the general field of real estate contracts, forms, and principles. Recent Federal housing legislation will be analyzed. Three credits. *Staff*

Social Security. (See Economics 147.) Strongly recommended for all business administration majors.

149. Business Policy. This is a co-ordinating course aimed to develop perspective and judgment and facility in solving business problems. Problems will be discussed in production, distribution, personnel, finance, control, legal and ethical aspects of business. Required of all majors in Business Administration. Five credits. Spring, Daily 9. *Gardner*

Money and Credit, Banking. (See Eocnomics 165, 166.) Strongly recommended for business administration majors.

Office Management. (See Secretarial Science 175.)

Economics of Business Cycles. (See Economics 171.) Required of all business administration majors.

190. Seminar in Business Education. (See Secretarial Science 190.)

191. Business Administration Seminar. Special reports and group discussion on current developments in business will be made. Open only to qualified juniors and seniors. One credit. Any quarter. Arranged. *Staff*

MERCHANDISING

62. Principles of Marketing. (See Ag. Econ. 52.) Required of all majors in business administration.

63. Salesmanship. The history, development and opportunities in sales work will be covered. The necessity and methods of securing proper preparation for sales work in order to meet the problems encountered in both direct selling and retail selling will be analyzed. The principles of preparing for interviews, proper presentation, gaining favorable attention, arousing the desire to buy, meeting objections, and creating acceptance will be studied. For those who desire, special projects can be carried out in relation to a particular field or type of selling. Lectures and assigned cases. Four credits. Fall, M. W. T. F. 11; Spring, M. W. T. F. 8. *Bate*

151, 152, 153. Problems in Merchandising. The aim of this course is to present by means of carefully selected cases the manager's merchandising problems. Methods of marketing merchandise; selection of channels of distribution for consumer and industrial goods; sales organization and control, advertising and sales promotion; stock-turn, price policies. Three credits each quarter. Fall, Winter, Spring, M. W. F. 10. *Bate*

154. Purchasing. This course involves a study of the significance of purchasing as a major activity in modern business. Consideration is given to organization, policies and control of the procurement function. Lectures and problems. Four credits. Fall, M. T. Th. 9. (Not given 1947-48.)

156. Principles of Advertising. Intended to give a viewpoint to those who as business executives will direct publicity programs. The course includes study of the structure of advertisements, the appeals used in the preparation of advertisements for different products, the choice of media, consumer research and the work of advertising departments and agencies. Actual cases will be studied and analyzed to lead the stuent to judge the possibilities of advertising as a sales tool for various proucts and firms. Selected reading and cases. Five credits. Spring quarter, Daily 2. *Bate*

160. Sales Management. This course aims to give a broad view of the important phases of sales administration, planning and execution as applied to manufacturing and wholesale concerns. It deals specifically with the structure and functioning of the sales organization and the correlation of its activities with those of the production and other departments of the business enterprise. Specific attention is given to such topics as: marketing policies, sales planning, sales branches, selection and training of sales force, control of sales operation, sales budgets, volume, margins and profits. Five credits. Spring, Daily 10. (Not given 1947-48.) *Bate*

161, 162, 163. Problems in Retail Distribution. For students who wish to gain an understanding of the marketing field from the viewpoint of the retail distributor. The problems given major attention are: types of retail institutions, accounting and statistics, location, store layout, merchandise classification, service policies, pricing, brand policies, buying, merchandise control, advertising and sales promotion, general organization and administration policies. Selected readng and cases. Three credits each quarter. Fall, Winter, Spring, M. W. F. 11. *Peterson*

164. Credit Administration. A study is made of the nature and functions of credit; forms of credit instruments; sources of credit information, organization and management of credit operating functions; technical and legal aspects of collections; credit and collection control. Fall. Three credits. M. W. F. 8. *Bate*

Economics

W. L. WANLASS, V. D. GARDNER, *Professors;* E. B. MURRAY, *Associate Professor;* L. J. ARRINGTON, *Assistant Professor.*

See pages 47 and 48 for courses that may satisfy group requirements.

Students majoring in this Department should include the following senior college courses in either the major or related work. Economics 106, 107a-b, 125, 131, 135, 140, 147, 155, 165, 166, 171, 174, 180, 181, 182, and 211; Agricultural Economics 113a; Business Administration 101 and 102; Policical Science 105, 106, 107, 108 and 116.

MASTER OF SCIENCE DEGREE IN ECONOMICS

The Economics Department offers a program of study leading to the Master of Science degree. The following courses may be taken in preparation for this degree: Economics 107a, 107b, 125, 131, 132, 135, 155, 165, 171, 174, 200, 205, 206, 207, 209 and 211.

The following courses may be taken for graduate credit by students in other departments: 107a, 107b, 125, 135, 165, 171, 174, 200, 205, 206, 207, 209 and 211.

27. Economic Development of the United States. A survey of the historical development of economic factors. Particular attention will be given to the rise of the American labor movement, the development of the monetary and banking system, the evolution of commerce and communication, and the course of American industrial development from the small one-man business of early times to the super corporations of today. Two credits. Winter, T. Th. 10. *Wanlass*

28. Economic Geography. The physical environment, weather, and climate. Map reading. Foods, raw materials, and fuels. Commerce and manufacturing. Regional geography with special emphasis upon the United States and the other countries at war. Three credits. Spring, M. W. F. 9. *Wanlass*

51. General Economics. This course is for the general college student regardless of his field of specialization. The emphasis is on an understanding of the principles and institutions that underlie the operations of the economic system. Five credits. Fall, Winter and Spring, Daily 8, 9, 10 and 2. *Staff*

52. Economic Problems. A continuation of Economics 51. The problems of labor, finance, economic instability, international economics, social waste, government control, and world economic systems. Required as a prerequisite to all senior college courses in the School of Commerce except in Agricultural Economics. Five credits. Fall, Daily 8; Winter, Daily 10; and Spring, Daily 10. *Staff*

106. History of Economic Thought. A critical study of the origin and the development of the economic theories of the leading thinkers in the leading nations of the world from 1750 to the present time. Three credits. Fall, M. W. F. 10. *Wanlass*

107a, b. Intermediate Economic Theory. A critical analysis of present day economic theories of value, distribution, and related subjects. This course must be taken by all students majoring in the departments of Business Administration, Agricultural Economics, and Economics. Prerequisites: Econ. 51, 52, or Ag. Econ. 53a, 53b. Three credits each quarter. Winter and Spring, M. W. F. 10. *Wanlass*

125. Labor Economics. The emphasis is on the theory and practice of collective bargaining. Special attention is given to recent legislation that has promoted the growth of organized labor. Current issues in industrial relations are critically analyzed. Three credits. Fall, M. W. F. 11. *Murray*

131, 132. Business Statistics. Application of statistical methods to problems of business with attention to graphs, analysis of time series, interpretation of index numbers and the statistics of particular industries and business in general. Prerequisites: Math. 111; Econ. 51 and 52. This course may be used for a major in Bus. Adm. Three credits each quarter. Winter and Spring, M. F. 9; Lab., W. 2-5. *Arrington*

135. Transportation Economics. Emphasis is placed on railroad transportation in the United States. Some attention will be given to highway and airway transportation. The underlying economic principles will receive more attention than the practical phases of transportation. Special attention will be given to those problems that are peculiar to the intermountain secion. Prerequisites: Econ. 51, 52. Three credits. Fall, M. W. F. 8. *Murray*

139. Risk and Risk Bearing. A study of the risks of economic life. Hedging, the short sale, futures and spot transactions and the produce and stock exchanges will be studied as well as the institution of insurance. Methods of shifting, reducing and assuming risks will be studied. Prerequisites: Econ. 51, 52. Three credits. Spring, M. W. F. 11. *Arrington*

140. International Economic Relations. Special attention will be given to the basic economic relationships existing between the industrial nations of the world, international commerce, tariffs, and trade restrictions, international debt and finance, and various means of promoting progress on a basis of sound economics. Prerequisites: Econ. 51, 52. Two credits. Fall, T. Th. 10. *Wanlass*

141. Current Economic Problems. A study, based upon current literature, of the problems of conservation, production, labor-management disputes, unemployment, government finance, monopolies and cartels, international economic relationships, and government participation in economic life. Special emphasis will be given to the impact of these problems on the intermountain West. Two credits. Spring, T. Th. 9. *Arrington*

145. Economics of Consumption. There is an economics of consumption that is quite as important as the economics of production. This course deals with personal and group expenditures, standards of living, budgets, variations in consumption, etc. Two credits. Winter, T. Th. 10.

147. Social Security. This course will survey the main divisions of social security legislation; these divisions are workmen's compensation, legal minimum wage, regulation of hours, unemployment compensation, old age insurance, family wage systems, and health insurance. Prerequisites: one course in Economics and one in Political Science. Three credits. Spring, M. W. F. 11. *Murray*

150. Types of Economic Organization. A study of the various forms of economic organization that have been proposed, including some of the Utopias, Marxian socialism, Fascism, National Socialism, the Single Tax, Consumer's Cooperatives, Syndicalism, Guild-Socialism, Communism, and Capitalism. Three credits. Spring, M. W. F. 8. *Murray*

155. Principles of Taxation. Taxation in war and peace. Government expenditures. Taxes as a means of raising revenue and as a means of social reform. The American tax system. The general property tax. Our income tax. Death taxes. Taxes upon business. Social insurance taxes. The effects of taxes on the American economy. War and postwar finance. Special attention is given to the tax problems of Utah. Three credits. Winter. (Not offered 1947-48.) *Wanlass*

165. Money, Credit and Prices. The structure and operations of money and financial institutions. Special attention given to bimetallism, the gold standard, the money market and the relation of money and credit to prices. Prerequisites: Econ. 51, 52. Three credits. Fall, M. W. F. 9. *Wanlass*

171. Business Cycles. A study in the economics of cyclical fluctuations. A critical examination is made of the more significant theories which have been offered in explanation of the cycle. Problems of prediction and control are examined. The history of business cycles is studied. Prerequisites: Econ. 51, 52. Three credits. Winter, M. W. F. 11. *Murray*

174. Corporate Concentration and Public Policy. The modern corporation, its history and characteristics. Minority control. "The managerial revolution." The holding company and consolidation. Industrial monopolies. Public regulation of monopoly and competitive practices. Industrial cooperation. Absentee ownership. Possible public policies: industrial planning, public utility regulation, government operation, government controls. Three credits. Winter, M. W. F. 10. *Arrington*

200. Research in Economics. Special investigations in problems in economics may be carried on by senior and graduate students. Credit will be granted according to work done. Any quarter. Time arranged. *Murray*

205. Graduate Seminar in Monetary and Banking Theory. The relation of monetary and banking theories to the problems posed by current world difficulties will be examined in some detail. Open to graduate students and seniors with adequate preparation. Two credits. Time arranged. *Murray*

206. Graduate Seminar in Fiscal and Tax Problems. The problems of attaining economic stability through use of government fiscal policy. Attention is focused upon the problems which have arisen as the result of World War II. Two credits. Time arranged. *Wanlass*

207. Graduate Seminar on Monopoly and Combination. Our economic society has been characterized by freedom of enterprise and competition, but numerous public and private attempts have been made to control the production and marketing of many agricultural and industrial commodities. The growth, development, and present status of these control schemes, both domestic and international, are traced and appraised. Two credits. *Arrington*

209. Graduate Seminar. A course designed to acquaint students with methods of research in the field of economics. A survey of the literature of economic research and practice in the carrying forward of research projects. Prerequisite: permission of instructor. Two credits. *Wanlass*

211. Graduate Seminar. Same as Economics 209, except that emphasis will be placed upon a study of bibliographical materials in the field of economics and a study of economic literature. Prerequisite: permission of instructor. Two credits. *Murray*

Political Science

F. D. DAINES, *Professor Emeritus;* M. R. MERRILL, ASA BULLEN, *Professors;* ..... *Assistant Professor.*

See pages 47 and 48 for courses that may satisfy group requirements.

Students majoring in this department are expected to have their course schedule approved by the Head of the department for at least six quarters prior to graduation. Exceptions may be made by the departmental faculty.

1. **Government and the Individual.** This course introduces the student into the political world of American democracy. Attention is given to an examination of totalitarian governments and the philosophies of fascism and communism which form the theoretical bases of these regimes. Democracy as practiced in the United States and Great Britain is contrasted with these systems. Five credits. Fall, Daily 8. *Merrill*

10. American National Government. Major attention is given to the national government. It is desirable but not required that it be taken before upper-division courses in Political Science. Five credits. Fall, Daily 9. Winter, Daily 8 and 10. Spring, Daily 10. *Daines*

11, 12, 13. Commercial Laws. Course 11 is a general survey course intended for students outside the School of Commerce as well as an introductory course for students who take any additional Commercial Law courses. Courses 12 and 13 are devoted to comprehensive study of the law of contracts and agency. Open to all students of sophomore standing or above. Three credits each quarter. Fall, Winter and Spring, M. W. F. 8. *Bullen*

15. American State and Local Government. The emphasis is on state, municipal and county or rural governments. It follows Political Science 10. Five credits. Spring, Daily 9. *Daines*

20a, b. Government in the Modern World. A general study of government designed particularly for students majoring in professional fields and particularly for students in the School of Engineering. Other students, however, may register for this course but students who register for Political Science 1 or 50 should not register for this course. Basic features of the American government system are discussed in 20a, while other contemporary political systems are discussed in 20b. Students may take either or both quarters without prejudice. Three credits each quarter. Fall and Winter, M. W. F. 9. *Merrill*

70. Comparative European Governments. A comparative study of the various forms and kinds of governments that have developed in the modern world with primary attention directed toward Europe. Three credits. Spring, M. W. F. 9. *Daines*

75. Latin American Governments. The various Latin American governments discussed. Attention also is given political and economic relations of the United States with the Latin American states. Three credits. Spring, M. W. F. 8. *Daines*

101. American Foreign Policy. The place of the United States in the family of nations as affected by our traditions, interests, and interpretations of international affairs. Three credits. Spring, M. W. F. 11. *Merrill*

102. International Political Relations. Psychological, economic, racial, and other obstacles to international cooperation, as exemplified in recent events. The Treaty of Versailles; international law, the League of Nations; and present day world politics including the present program for world cooperation and government are discussed. Three credits. Winter, M. W. F. 11. *Merrill*

103. Principles and Problems of Government. A general survey of public affairs and governmental action in the modern world. Designed primarily for upper division students majoring outside the field of the social sciences but who desire some competence in the analysis of modern politics. Three credits. Fall, M. W. F. 11. *Merrill*

104, 105, 106, 107, 108. Commercial Law. Course 104 is a study of the law of negotiable instruments, while 105 and 106 include the study of the law of bailments, sales of personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the study of the law of real property, including estates, deeds, conveyancing, abstracts of title, mortgages, wills. Courses 105 and 106 alternate with 107 and 108; 107 and 108 will be given in 1946-47. Prerequisites: Political Science, 11, 12, 13. Three rcedits each quarter. Fall, Winter and Spring, T. Th. 8, M. 12. *Bullen*

110. Post-War Problems in International Relations. Examines the various proposals for a world organization now being made and instituted together with an analysis of the various philosophies and system of government that conceivably might arise as a result of vast changes now evident in the world. Three credits. Spring, M. W. F. 10. *Daines*

117a, b, c. American Political Thought. The development of American ideas concerning the State and political authority from colonial times to the present. The nature and purpose, methods of organizing and controlling political action in terms of historical and social origins; and applicability to modern problems. Two credits each quarter. Students may register for one, two or three quarters. Fall, T. Th. 10, Winter, T. Th. 10, Spring, T. Th. 10.

124. Public Opinion and Propaganda. Open to upper division and graduate students, and to lower division students upon recommendation of the departmental instructors. Considers politics in its dynamic aspects. The nature of public opinion and the various concepts and techniques of propaganda in domestic and international relations employed by pressure groups, political parties and national states. No prerequisite. Three credits. Fall, M. W. F. 11. *Staff*

125. Political Parties and Practical Politics. A study of organization and practices of political parties. Three credits. Winter, M. W. F. 8. *Daines*

127. Constitutional Law. A foundation course in American Constitutional Law with the case method being used extensively. Prerequisite: Political Science 10. Five credits. Fall, Daily 8. *Daines*

129. Public Administration. An introduction to the study of public administration and administrative law for those contemplating public service careers. The role and techniques of management in public enterprise, the organization, legal bases, planning, staffing, personnel, finance, and public relations of modern government. Five credits. Winter, Daily 9.

140. American Legislation. Organization and procedure of legislative bodies. Influences at work in and the character of the output of the national and state legislatures. The laboratory method of approach is used as far as is feasible. Parliamentary law is emphasized. Three credits. Winter, M. W. F. 11. *Daines*

145a, b. History of Political Thought. Political Science 145a, covers political theories and ideas from the Greek period to Martin Luther. Political Science 145b continues the study of political theories from Luther to 18th Century. Three credits each quarter. Students may take either or both quarters. Fall and Winter, M. W. F. 9. *Daines*

150. Recent Political Thought. Political ideas and writers from the close of the 18th Century to the present, with a particular emphasis on analysis of the backgrounds of currently changing political concepts. Examination of contemporary political ideologies. Three credits. Spring, M. W. F. 8.

180, 181, 182. Current Political Problems. A series designed for upper division students. Students may take any quarter without the preceding quarter or quarters, with the consent of the instructor. Two credits each quarter. Fall, Winter, Spring, M. W. 1. *Merrill*

200. Research in Political Science. For senior and graduate students. Time and credit arranged. *Daines*

Secretarial Science

V. D. GARDNER, *Professor;* L. MARK NEUBERGER, *Associate Professor;*
INA DOTY, CLARA P. WEST, *Assistant Professors.*

Students majoring in Secretarial Science must complete the following courses in addition to the institutional requirements for graduations. Elementary shorthand and elementary typewriting are not required of students who have had the equivalent.

Curriculum in Secretarial Science for B. S. Degree

Dept.	No.	Title of Course	Credit
Sec. Sci.	30	Business Communications	3
Sec. Sci.	65	Indexing and Filing	3
Sec. Sci.	75, 76, 77	Elementary Shorthand	9
Sec. Sci.	80, 81, 82	Intermediate Shorthand	9
Sec. Sci.	69, 70, 71	Transcription Practice	3
Sec. Sci.	86, 87, 88	Elementary Typewriting	3
Sec. Sci.	89, 90, 91	Advanced Business Typewriting	3
Sec. Sci.	94	Burroughs Calculator	2
Sec. Sci.	90	Commercial and Bank Posting	2
Math.	30	Mathematics 30	3
B. A.	1, 2	Introductory Accounting	10
B. A.	25	Introductory Business Administration	5
English	2	Mechanics of Writing	3
English	5	Scientific Vocabulary (or Foreign Language†)	3
†Econ.	51	General Economics	5
†Econ.	52	Economic Problems	5
Sec. Sci.	170	Statistical Typewriting	2
Sec. Sci.	175	Office Management	3
Sec. Sci.	183, 184, 185	Advanced Speed Shorthand	9
Sec. Sci.	186, 187	Secretarial Science	6
‡Sec. Sci.	179	Methods of Teaching Typewriting	3
‡Sec. Sci.	180	Methods of Teaching Shorthand	3
Sec. Sci.	190	Seminar in Business Education	2
B. A.	101	Problems in Accounting Principles	3
B. A.	Elective	Business Administration (Senior College)	3
Econ.	Elective	Economics (Senior College)	3
Electives		Electives (27 of which must be Senior College)	42

Students wishing a teaching certificate in Secretarial Science must add the following courses: Psychology 3 and 102a and b, Education 111, 113, 127, 19a, 129b, 114, 116, 145, and Physiology 145. See School of Education for additional requirements.

A two-year course is also offered in Secretarial Science for students who do not wish to qualify for a B.S. degree but who wish to fit themselves for stenographic positions as quickly as possible.

Two-Year Secretarial Course

First Year

Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Biol. Science	5	Accounting 1	5	Accounting 2	5
Mechanics of Writing	3	Calculator 94	2	Bus. Communications	3
El. Shorthand	3	El. Shorthand	3	Bank Posting 98	2
Typewriting	1	Typewriting	1	El. Shorthand	3
P. E. or M. S.	1	El. Psychology	5	Typewriting	1
Mathematics 30	3	P. E. or M. S.	1	P. E. or M. S.	1
Total	16	Total	17	Total	15

†These courses count toward filling the group requirements.
‡Required for a teaching certificate.

Second Year

Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Int. Shorthand	3	Int. Shorthand	3	Sophomore Comp.	5
Transcription Pract.	1	Transcription Pract.	1	Int. Shorthand	3
Adv. Typewriting	1	Adv. Typewriting	1	Transcription Pract.	1
Bus. Administr'n 25	5	Economics 51	5	Adv. Typewriting	1
Indexing and Filing	3	Pol. Science 12	3	Economics 52	5
Pol. Science 11	3	P. E. or M. S.	1	P. E. or M. S.	1
P. E. or M. S.	1	Electives	2	Ediphone Transcription	1
Total	17	Total	16	Total	17

30. Business Communications. Fundamental principles of business letter writing will be studied. Practice will be given in writing sales, order, collection, adjustment, and application letters. Prerequisite: English 2. Three credits. Winter, M. W. F. 9. Spring, M. W. F. 10. *Neuberger*

65. Indexing and Filing. Drill and practice will be given in alphabetic, numeric, triple check automatic, subject, decimal, geographic, and soundex methods of filing. The indexing, coding, and filing of letters, cards, blue-prints, catalogs, and other business forms will be emphasized. Fall, M. W. F. 9. Winter, M. W. F. 10. Spring, M. W. F. 10. *Neuberger and Doty*

***69. Transcription Practice.** Designed to develop skill and speed in the transcription of letters from shorthand notes. Students must be able to take dictation at not less than 60 words a minute and type at least 40 words a minute. One credit. Fall, T. Th. 12. Winter, M. W. 12. *West and Doty*

***70. Transcription Practice.** Continuation of 69. One credit. Winter, T. Th. 12. Spring, M. W. 12. *West and Doty*

***71. Transcription Practice.** Continuation of 70. One Credit. Spring, T. Th. 12. *West*

75. First Quarter Shorthand. Designed for students who have had no previous training in shorthand and includes a study of the fundamentals of shorthand by the functional method. Emphasis placed on developing fluency in reading and writing from shorthand plates. Three credits. Fall, Daily 10. Winter, Daily 10. *West and Doty*

76. Second Quarter Shorthand. Continuation of course 75. Emphasis will be placed on the writing of shorthand. Three credits. Winter, Daily 10. Spring, Daily 10. *West and Doty*

77. Third Quarter Shorthand. Continuation of course 76. Practice will be given in new-matter dictation. Three credits. Fally, Daily 10. Spring, Daily 10. *Doty and West*

80. Intermediate Shorthand. Designed for students who have had previous training in shorthand and who are able to take dictation at 60 words a minute. Includes a review of the theory of Gregg shorthand and the development of new vocabulary and phrase writing. Students must be able to type at least 40 words a minute and must register for Transcription Practice 69. Three credits. Fall, M. W. F. 11. Winter, M. W. F. 2. *Doty and West*

81. Intermediate Shorthand. Continuation of 80. Must be accompanied by Transcription Practice 70. Three credits. Winter, M. W. F. 11. Spring, M. W. F. 2. *Doty and West*

82. Intermediate Shorthand. Continuation of 81. Must be accompanied by Transcription Practice 71. Three credits. Spring, M. W. F. 11. *Doty*

86. First Quarter Typewriting. For students who have had no previous training in typewriting. This course is designed to develop a thorough knowledge of the keyboard and to give practice in the use of the mechanical features of the typewriter. Special attention will be given to the development of typewriting for personal use. One credit. Fall, T. Th. 8, F. 12. Winter, T. Th. 8, W. 1. Spring, T. Th. 8, W. 1. *Doty and Neuberger*

*Required of all who register for Intermediate Shorthand 80, 81, 82.

87. **Second Quarter Typewriting.** Continuation of 86. Attention is given to sentence and paragraph practice and to letter writing. One credit. Fall, T. Th. 2, W. 1. Winter, T. Th. 2. F. 12. Spring, T. Th. 2, F. 12. *West and Doty*

88. **Third Quarter Typewriting.** Continues with the advanced development of the features given in 86 and 87, and in addition includes tabulating. One credit. Winter, T. Th. 10. Spring, T. Th. 10. *Neuberger*

89, 90, 91. **Advanced Business Typewriting.** Designed for students who have had one year of typewriting. Fall quarter: Special attention will be given to advanced letter writing, telegrams, invoices and billing, and advanced tabulation. Winter quarter: Advanced legal forms and manuscripts. Spring quarter: Rough drafts, advanced secretarial problems, and the care of the machines. One credit each quarter. Fall, Winter, Spring, T. Th. 9. *Neuberger*

92. **Ediphone Transcription.** Training in machine transcription, including the operation of dictating and shaving machines. Not open to freshmen. Students must arrange for three hours of practice weekly. See instructor before registering. One credit. Fall, Winter, Spring. *West*

94. **Burroughs Calculator.** Practice in addition, multiplication, subtraction, and division on the Burroughs calculators and the application of the machine to various business computations such as percentages, discounts, prorating, decimal equivalents, and constants. Two credits. Fall, M. 2-4, W. 2; Winter, M. 2-4, W. 2; Spring, M. 2-4, W. 2. *Neuberger and Doty*

98. **Commercial and Bank Posting.** Practice in the application of the Burroughs posting machine to bookkeeping procedure in commercial and financial institutions and banks. Two credits. Fall, M. T. or Th. 3-5; Winter, T. W. Th. 3-5; Spring, M. or W. 3-5. *Neuberger and Doty*

170. **Statistical Typewriting.** For juniors and seniors majoring in business administration, economics, and secretarial science. Practice will be given in setting up charts, tables and reports. Prerequisite: Sec. Sci. 89, 90 and 91 or equivalent work. Two credits. Fall, T. Th. 10; W. 1. (Two additional hours arranged.) *Neuberger*

175. **Office Management.** Emphasis is placed on principles of office management, duties and responsibilities of the office manager; types of organization; methods of control; office arrangement and equipment; job analysis; selection, employment, and training of employees. Prerequisites: introductory accounting and general economics. Three credits. Fall, M. W. F. 10. *Neuberger*

*179. **Methods of Teaching Typewriting.** Recent developments and practices in the teaching of typewriting. The analysis of objectives, laws of learning, organization of materials, texts, standards of achievement, methods of acquiring speed and accuracy will be considered. A course for those preparing to teach typewriting and for those engaged in teaching who wish to render their teaching more effective. Three credits. Winter. Arranged. *Neuberger*

*180. **The Teaching of Shorthand.** The newer methods and trends in the teaching of shorthand, and observation and practice in shorthand classes for those preparing to teach. Three credits. Fall. (Consult instructor before registering.) Arranged. *West*

183, 184, 185. **Advanced Speed Course in Shorthand.** Designed for students who have had at least two years of shorthand and are able to take dictation at not less than 100 words a minute. Special emphasis will be placed on increasing shorthand speed through speed phrases and reporting shortcuts. Practice will also be given in advanced transcription. Three credits each quarter. Fall, Winter and Spring, M. W. F. 11. *West*

186, 187. **Secretarial Science.** Designed to acquaint students with office routines and procedures and to give them practice in the quantity production of transcripts and business papers. Includes training in the operation of the Ediphone. Attention will be given to office conduct and attitudes, personal qualities of a secretary, and the procuring of a position. Prerequisite: Two years of shorthand and typewriting, general economics, introductory accounting, and business communications. Three credits each quarter. Winter and Spring, M. W. F. 1. *West*

*Either (but not both) of these courses may be used as an elective course in Education.

189. Practicum in Business Education. Provides an opportunity for the planning and development of practical or creative projects in the field of Business Education. Experienced teachers and students, who are registered for teacher training work, are encouraged to build projects around actual school situations. One or two credits. Time arranged. *Neuberger*

190. Seminar in Business Education. A reading and research course for junior and senior students majoring in business administration and secretarial science. Special reports on current business education problems and literature will be made. Two credits. Spring, T. Th. 8. *Neuberger*

Sociology

JOSEPH A. GEDDES, W. B. PRESTON, *Professors;* JOSEPH N. SYMONS, LAWRENCE S. BEE, R. WELLING ROSKELLEY, *Associate Professors;* ....., *Assistant Professor;* HOWARD V. JESSOP, CARMEN FREDRICKSON, *Instructors.*

Departmental Objectives:

1. To perform an integrative function. Scientific information on social living has gradually become segregated into separate disciplines known as the social sciences. Each of these sciences at times, and one of them as a normal responsibility, faces the task of integrating the contributions of the others. Sociology, because of the nature of its subject matter, has come to be looked upon generally as having major integrative responsibility. This responsibility is met by offering such courses as Social Change, Modern Social Problems, Rural Sociology, and Courtship and Marriage.

2. To provide for students who become majors, and as many other future citizens as may be interested, the steadily accumulating, tested, basic information dealing with people and groups in relationship. The most basic of this information is found in Principles of Sociology and Rural Sociology.

3. To offer to majors and minors and others whose training warrants, further information and experience, under supervision, in special fields pertaining to relationship. The fields selected for development by the Department have been chosen because of their importance to the people of the state, and particularly to future citizenry. The fields are (1) General Sociology, including research, (2) Family Welfare, (3) Social Change, and Social Disorganization, (4) Rural Welfare, Community Life and Social Institutions.

A dominant purpose in providing the information indicated in 1 and 2 is to enable students to become socialized citizens; to aid them to make more satisfactory progress in personality development and to assist them to achieve balance in attitude, in participation and in philosophy of living.

4. Objectives in the Division of Social Work are practical in nature. The aim is to provide preparation for social service in the senior year and more advanced training in one year of graduate study. Students who take social work during the senior year and then take social-work positions may later continue their studies and secure the social work certificate or the masters degree. The aim includes also pre-professional training on the under-graduate level through which a knowledge of rural conditions is secured. This information includes studies of rural standards of living, rural housing, rural means of communication, rural taxation, agricultural prices, rural institutions, rural trends, etc.

MASTER OF SCIENCE DEGREE IN SOCIOLOGY

The Department of Sociology offers work leading to the Master of Science Degree. Research is promoted through departmental relationship with the Agricultural Experiment Station and with federal agencies. Students majoring in Sociology may use the following courses of the 100 series for graduate credit: Sociology 102, 110, 140, 153, 154, 156, 160, 170, 172, 181, and Sociol Work 100, 110, 140, 173, 177, 180.

The courses above listed may also be used by students in other departments for graduate-credit as may also Sociol Work courses 140, 145, and 180.

Sociology 70 or Sociology 10 is prerequisite for all Upper Division courses in Sociology, except Sociology 160.

Nuclei courses about which the major and the special group courses should revolve are suggested, as follows:

General Sociology and Research—Sociology 70, 140, 153, 190, 191, 192, 193, 194, 195, 202, 207, and S. W. 190.

Family Welfare—Sociology 60, 160, 162.

Social Change and Social Disorganization—Sociology 5, 52, 102, 154, 162. 170, 172, 207.

Rural Welfare, Community Life and Social Institutions—Sociology 10, 156, 220; Social Work 140, 214, 222, 275.

10. Rural Sociology. Attempts to provide a groundwork of information which will lead to enlightened rural citizenship and provide a constructive philosophy for living in the country. Concise digests of programs in 25 or more fields are made. Rural social psychology is given emphasis. Conditions in rural Utah are studied. Five credits. Fall, Daily 8. Spring, M. W. F. 9. *Geddes and Roskelley*

25. Elementary Social Statistics. Techniques of using statistical method in studying social problems with emphasis upon logical methods of collection, tabulation, graphic portrayal, averages, dispersion, reliability, elementary sampling and simple correlation with brief consideration of the theoretical implications. Majors in Sociology and Social Work should take this course. Five credits. Winter, M. W. F. 10; Lab. T. Th. 3-5. *Roskelley*

40. Social Psychology I. Personality development among different social classes and peoples. Analysis of crowds, publics, social movements and other collective behavior; ideologies and institutions. Prerequisites: Soc. 70 and Psy. 3. Three credits. Winter, M. W. F. 8. *Bee*

52. The Crime Problem. This course is concerned with the broader aspects of crime as a serious contemporary problem. Such topics as the extent, nature, causes of, theories concerning, techniques for coping with, programs for prevention, etc., furnish the course content. Three credits. Fall, M. W. F. 9. *Symons*

60. Courtship, Marriage and the Family. Designed to help unmarried and married students understand the roles of social and emotional factors in personality development, courtship, mate selection and marital adjustment. Open to all students. Fall, Winter, Spring. Four credits. M. W. Th. F. 11. *Bee*

70. Principles of Sociology. The foundations of Sociology are studied in order that a plan of social progress may be formulated. The problems of social origins, social structures, public opinion, social activities, social organization, and social evolution are carefully considered. Prerequisite for all Upper Division classes. Five credits. Fall, Daily 8, 10. Winter, Daily 8, 11. Spring, Daily 8, 11. *Staff*

100. Educational Sociology. This course deals with the influence of the social processes and social changes on school curricula, objectives and teachers. It includes an appraisal of educational goals in the light of our present social needs. Three credits. Fall, T. Th. 11, W. 12. *Staff*

110. Utah Rural Social Problems. Problems dealing with recent population movements, migration, employment and specific rural organizations are selected for study and analysis. Three credits. Fall, M. W. F. 9. *Geddes*

Public Opinion. (See Political Science 124.)

140. Social Psychology II. Relationship between personality development and ideological patterns among various social classes and cultures. Prerequisite: Soc. 40. Spring, M. W. F. 9. *Bee*

153. History of Social Thought. The emergence and development of social thought from early periods is traced to August Compte. From this point important developments in Europe and America are studied. Particular emphasis is given to the American field. For majors and minors in Sociology. Others on instructor's approval. Five credits. Spring, Daily 8. *Symons*

154. Population Problems. Study of distribution, characteristics, and trends in the population. Special attention will be given to an analysis of Utah population trends. Three credits. Winter, M. W. F. 8. *Roskelley*

156. Social Institutions. Similarities and differences in the life histories of institutions as they emerge, grow and decline are appraised. Society's efforts to keep institutions attuned to the objectives for which they were organized are observed. Three credits. Spring, M. W. F. 10. *Geddes*

160. Family Relations. The social-emotional development of the child in the family. Marital adjustment; social-cultural difference in family behavior; problems; ideological considerations. Prerequisite: Soc. 60. Fall, primarily for sociology majors and minors. Winter, Spring for other students. M. W. F. 8. *Bee*

170. Juvenile Delinquency. The causes of delinquency are considered with the purpose of arriving at intelligent remedies. Various methods of home, social, and institutional treatment are studied; parental cooperation, personal supervision allied with probation and parole, institutional treatment, etc. Three credits. Winter, M. W. F. 10. *Symons*

172. Poverty and Dependency. A study is made of the extent of poverty, its causes, remedies now in use, and others which give promise. Social methods of caring for dependents are examined. Emphasis is placed on programs which look to prevention and to minimization as well as to adequate care. Prerequisite: 52. Three credits. Fall, M. W. F. 8. *Staff*

174. Organized Crime. Criminal behavior is becoming more thoroughly organized. As such it has historical backgrounds and a natural history in the U. S. These: the organization, the fields most organized, and counteracting techniques are the concern of the course. Prerequisites: Soc. 52 and 170, or Instructor's approval. Three credits. Spring, M. W. F. 11. *Symons*

180, 181, 182. Current Sociological Problems. For upper division and graduate students. May be taken any quarter. Two credits each quarter. *Staff*

187. Research Methods In Sociology. An advanced course in Methods of Social Research. Soc. 25 is prerequisite. Three credits. Winter, M. W. F. 10. *Staff*

190, 191, 192, 193, 194, 195. Seminar in Sociology. One credit each quarter. Fall, Winter and Spring. Time arranged. Six quarters required of majors in Sociology. *Staff*

201. Research in Sociology. For advanced students only. A project is organized and field work is carried on under supervision. Original studies are made. Prerequisite: Soc. 70; Math. 111 recommended. Fall, Winter, Spring. Time arranged. *Staff*

202. The Study of Society. An advanced course in Sociological theory. Sociology is studied as a classified body of facts and as a method of investigation. Spring, Daily 9. *Geddes*

207. Graduate Seminar. Short subjects falling within the field of Sociology and pertinent to it but not available in regular courses are selected for study. Winter, M. 2-4. *Staff*

220. Rural Organization. Social organization in small towns, villages and open country. Required for students training for rural social work. Two credits. Spring, T. Th. 9. *Geddes*

Social Work

Division of Social Work.

JOSEPH A. GEDDES, *Director.*

An integrated five-year plan of study is offered which includes an undergraduate major in social work and either a certificate in Social Work or a Master of Science degree on successful completion of one year of graduate work. For the Master's degree a thesis is required.

A major in social work at the college may be secured through completion of: (1) 19 credits of professional social work courses during the Senior year,

and (2) through completion during the Freshman, Sophomore and Junior years of:

1. 6 credits in Physical Education or Military Science
2. Group requirements
3. Background courses in the social sciences and in related fields to include:
   - 8 credits in Sociology
   - 8 credits in Political Science
   - 8 credits in Psychology
   - 8 credits in Economics or Agric. Economics
   - 8 credits in Public Health and Home Economics
   - 5 credits in History

Specific courses which should be associated with the undergraduate professional work courses and which should be taken during the Freshman, Sophomore, Junior and Senior years are:

Psy.	3	Elementary General Psychology
Foods	5	Principles of Nutrition
Soc.	10	Rural Sociology
Ag. Econ.	54	Principles of Agricultural Econ.
Psy.	103a 103b 103c	Clinical Psychology
Soc.	110	Utah Rural Social Problems
Soc.	25	Elementary Social Statistics
S.W.	145	Mental Hygiene
Econ.	147	Social Security
Soc.	160	Family Relations
Soc.	170	Juvenile Delinquency

Required professional social work courses for a major in social work are:

S.W.	100	Principles of Social Case Work I	3
S.W.	110	Field Work I	4
S.W.	140	Community Organization	3
S.W.	173	The Field of Social Work	2
S.W.	177	Soc. Treatment of Sch. Children's Prob.	2
S.W.	190	Methods of Social Research	3
S.W.	195	Seminar in Social Work	2
			19

Professional courses open to graduate students working for the Social Work certificate or the M.S. degree in Social Work are:

S.W.	201	Principles of Social Case Work II	3
S.W.	211	Field Work II	4
S.W.	212	Field Work III	2–4
S.W.	214	Field Work in Group Work	2
S.W.	222	Social Work in Rural Communities	2
S.W.	230	Social Psychiatry I	2
S.W.	231	Social Psychiatry II	3
S.W.	250	Public Welfare Administration	3
S.W.	260	Medical Information	3
S.W.	270	Child Welfare	3
S.W.	272	Foster Home Care and Placement of Ch.	3
S.W.	275	Principles of Group Work	2
S.W.	276	Contemporary Social Work Literature	3
S.W.	295-296	Seminar in Social Work	2

100. Principles of Social Work I. Principles and methods of modern family case work. Investigation, diagnosis and treatment of economic, medical and conduct problems are studied. Three credits. Winter, M. W. F. 10

110. Field Work I. Field work centers will be maintained in selected public and private agencies and supervision will be provided under college direction. S. W. 100 should precede or be taken concurrently. Two, three or four credits. Fall and Winter, T. Th. 9-5. *Jessop*

140. Community Organization. The growth of the community movement is traced. The organization of community forces into organized agencies and the development of communal programs is emphasized. Disorganizational factors are isolated. Three credits. Spring, M. W. F. 9. *Geddes*

145. Mental Hygiene. Social and cultural changes that have given rise to probelms of adjustment. Reactions to stress; "preventive" growth and adaptation. Three credits. Spring, M. W. F. 8. *Bee*

173. The Field of Social Work. The historical development of social work in England and America, including the evolution of the theory underlying the modern social work movement. Designed for students entering the fields of teaching, home demonstration or county agent's work, as well as social work. Two credits. Fall. *Staff*

177. Social Treatment of School Children's Problems. Analysis, investigation, and treatment of the problems of school children. Two credits. Spring, M. W. 10.

186. Methods of Social Research. Technique of defining the problems, developing schedules, interviewing and analyzing sources of material. Majors in Sociology and Social Work should take this course. Three credits. Winter, M. W. F. 10. *Staff*

201. Principles of Social Case Work II. A continuation of S.W. 100. Interviewing, recording and treatment are stressed. Three credits. Spring, M. W. F. 9.

211. Field Work II. A continuation of Field Work I. Two or four credits. Winter and Spring, T. Th. 9-5. *Jessop*

212. Field Work III. A continuation of Field Work II. S.W. 100, 201 are prerequisites. Two or four credits. Spring, T. Th. 9-5. *Staff*

214. Field Work in Group Work. A limited amount of leadership training and observation of groups in action is available to students who have completed Social Work 275. Two credits. Spring. Time arranged. *Staff*

222. Social Work in Rural Communities. Social work in relation to problems of organization, administration and community relations, particularly as they affect rural counties. Two credits. Spring, W. 3-5. *Staff*

230. Social Psychiatry I. Emotional and intellectual factors in adjustment problems; diagnosis of mental and nervous disorders; the interrelation of physical, emotional, mental and environmental factors are stressed. Three credits. Fall, W. 11 and 1, F. 11. *Staff*

231. Social Psychiatry II. An advanced course open only to students of social work who have had S.W. 230. Three credits. Winter, M. W. F. 2. *Bee*

250. Public Welfare Administration. A study of the history and methods of public welfare administration in state and county public welfare activities. Three credits. Winter, M. W. F. 8.

260. Medical Information. A study of diseases most frequently encountered in social work. The interrelations of disease and social conditions are appraised. Medical resources are considered. Open to social work students in the enior year. Three credits. Fall. Time arranged. *Preston*

270. Child Welfare. Deals with programs for meeting the needs of children. Consideration is given to parental rights as evidenced in child labor laws, the Juvenile Courts, aid to dependent children, the changing status of the illegitimate child, and public organization for more effective administration of laws relating to child dependency, delinquency, neglect, and handicapped children. Three credits. Winter, M. W. F. 11. *Staff*

272. Foster Home Care of Children. Deals with substitute parental care, placement and supervision of children in foster homes, including day care, boarding care, and adoption. Spring, M. W. F. 1. *Staff*

275. Principles of Social Group Work. Principles of group participation, of leadership and followership. Personality adjustments and therapeutic values in social group work. Winter, M. 2-4.

276. Contemporary Social Work Literature. This course attempts to review the current contributions to the various fields of social work literature as well as to acquaint the student with the character of the periodical literature that has been published during the previous year. Two credits. Winter, M. W. 9.

295, 296. Seminar in Social Work. For advanced students in the Division of Social Work. Newer trends are considered in interviewing, recording, and treatment in the case work field. One or two credits. Spring. Time arranged. *Staff*

SCHOOL OF EDUCATION

E. A. JACOBSEN, *Dean*

General Information

THE School of Education, as an administrative unit of the College, comprises the departments of Art, Music, Psychology, Physical Education and Education. A major function of these departments is the preparation of teachers for the elementary and secondary schools. Each department, in addition, offers courses contributing to general education and courses designed to supplement the major work of other departments of the College.

The Bachelor of Science degree with a major in Education is designed primarily for those students who are preparing to teach in elementary schools, or for those who desire to meet requirements for administrative or supervisory credentials. Although provision is made for a major in secondary education, students preparing to teach in the secondary schools will usually find it advisable to take their Bachelor's degree in the particular school in which their major work is chosen. Arrangements have been made with the different schools of the College to provide the candidates for their respective degrees with the necessary professional courses to qualify them to teach in these fields. Requirements for a teaching major are set forth by the various departments.

The School of Education stands firmly on the principle that teachers must not only be liberally educated but be thoroughly prepared in the subjects which they are to teach.

For teachers in junior and senior high schools it is intended that the student shall be prepared to teach in two high school teaching fields. The student's mastery of essential subject matter in the teaching field, rather than the credit hours, should operate in determining subject matter proficiency. Teaching fields should be chosen by the student on basis of his individual abilities and interests and also in the light of available information concerning the demands for beginning teachers and the supply in the respective fields. The curriculum in professional education and psychology aims to impart to prospective teachers the meaning of education in its relation to desirable social objectives, the organization and administration of schools in relation to the needs of the learner and to social aims, an understanding of the nature and needs of the learner and the learning process, and by means of certain technical courses in education, to develop skills in the art of teaching.

The sequence of professional courses in Psychology and Education is such that it is necessary to study in these fields before the final year. A detailed plan of study is not outlined or prescribed. The student who plans to prepare for teaching will usually find it advantageous to devote the first two years to securing a well-balanced general education, giving some attention to courses prerequisite to advanced study. During these years some emphasis may also be placed in the field of specialization. The third and fourth years should be devoted primarily to concentration in the major field of study and to professional subjects in Psychology and Education.

For requirements for admission, certification, and graduation, see pages 43 to 52.

TEACHER PLACEMENT BUREAU

MRS. VERA A. CHRISTENSEN, *Secretary*.

The College is fundamentally interested in placing qualified teachers in teaching positions. To accomplish this purpose the Teacher Placement Bureau has been organized in connection with the Department of Education. All students who qualify for teaching certificates are expected and urged to register with the Placement Bureau to facilitate the compliation of the proper credentials to be used in placement for the current and future years.

Candidates for teaching positions should join the Placement Bureau in the early part of the winter quarter or not later than the first week of the spring quarter.

TEACHER CERTIFICATION

C. E. McCLELLAN, *Chairman.*

The School of Education is designated by the State Department of Public Instruction as its official representative in administering certification requirements so far as regular students of the College are concerned.

The certification standards conform as nearly as may be to the requirements of the State Board of Education. With the Bachelor's degree the student may qualify for any one of the following certificates:

Teacher's Certificate for Secondary Schools

Teacher's Certficate for Elementary Schools

Teacher's Certificate for Kindergarten

Librarian's Certificate for Elementary Schools

Librarian's Certificate for Secondary Schools

Two-year Counselor's Certificate

Certificate for Teachers of Vocational Agriculture in Secondary School

Certificate for Teachers of Home Making in Secondary School

Two-year Certificate for Teachers of Industrial Arts for Secondary School

Specific requirements for each certificate are listed with the departments in which the major work is offered.

TEACHER TRAINING

JOHN C. CARLISLE, *Director.*

The College offers complete programs of teacher training in all phases of public school work. Facilities for practice teaching have been carefully chosen. The Nursery School, operated on the campus by the Department of Child Development in the School of Home Economics, is concerned particularly with the pre-school child. Teachers in Home Economics, Agricultural Education, Industrial Arts, and Technology do their practice teaching under the direction of the departments concerned in selected schools throughout the state.

For the training of kindergarten and general elementary teachers the College maintains the Whittier School, one of the elementary schools of Logan City, which includes the kindergarten and grades one to six inclusive. The teachers in the school, selected particularly for their fitness to serve on the teacher education program, are regular members of the College faculty. The training school, in addition to its function as a center for teacher education, serves the School of Education as a laboratory in which child growth and development are studied and desirable school practices are developed.

By special arrangement with the local board of education the facilities of the Logan Junior High School and Logan Senior High School are utilized as practice teaching centers in secondary education. Each school has an enrollment of approximately seven hundred pupils. Because of this enrollment both schools are able to offer a well balanced schedule of classes and a comprehensive program of student activities, all of which are available for cooperative use in the program of teacher education. Arrangements are made for training in other schools as needed.

Art

CALVIN FLETCHER, *Professor Emeritus;* H. R. REYNOLDS, *Professor;* JESSIE LARSEN*, EVERETT THORPE, *Assistant Professors;* ....., *Instructor.*

The Art Department is primarily a service department correlating with Home Economics, Industrial and Mechanic Arts, Commerce and other major divisions of the College as well as with the various departments of the School of Education. Unless otherwise stated its courses are adapted to students without special talent or interest in the field as well as to the needs of the talented. In addition, however, it is adequately prepared to offer major and minor work as listed below.

Art is recognized as one of the great divisions of the humanities which are so essential to the making of the right kind of leaders in a world of overbalanced technology. Art 1, 2, 3, 22, 26, 32 and 33 may be used to satisfy the Junior College requirements in the Language and Arts group.

Majors:

Teaching majors in secondary Art must complete Art 1, 2, 31, 32, 133, 122, 123, 124, 125, 126, 127, 151, 110 (four credits), 104 (ten credits), 106 (three credits), 114 (four credits), 112 or 113 (three credits).

Teaching majors for elementary grade supervision or special teaching of drawing, handwork, and creative expression will complete Art 1, 2, 3, 31, 123, 124, 125, 127, 152, 110 (2 cr.), 104a and b (10 cr.), 106 (3 cr.), 114 (8 cr. in at least 4 lines). Art 20 (2 cr.), Art 112 (2 cr.).

Majors may specialize in the following fields on these conditions: They must show aptitude for the work and submit at least 30 hours of credit in the field in addition to Art 1, 2, 32, 133, 126, 127, 124, and 125. Fields open for election are Commercial Art, Fashion Drawing and Illustration, Photography, Painting, Sculpture, General Illustration, Interior Decoration, Industrial Design, Hobby Craft Direction, Occupational Therapy.

Minors:

Education majors in secondary education desiring an art teaching minor should take Art 1, 2, 151, 32, 104 (five credits), 123, 126, 127, 124 and 125b.

Textiles majors desiring a teaching minor in Art should take Art 104c, 151, 113 or 114, 122 and 127 or equivalent.

Industrial Arts majors wishing a teaching minor in Art should take art 32, 113, 114, 151, 127 and 124 or equivalent.

General teaching minors in Art on the secondary level with majors in English, Music, Physical Education, History, etc., should take Art 133, 126, 3, 151, 104a and b (two credits in each), and 106 (two credits).

Majors in Elementary Education who elect Art as a specialization field should take Art 1, 2, 125a, 31, 114 (three credits), 133, 126, 152, 124, and 104a or b (four credits).

Two-year full time specialization or trade courses in Show Card and Sign Writing, Costume and Commercial Illustration, Painting and Sculpture are also available. Students wishing such courses should consult the head of the department.

1. Elementary Design and Form Study. Creative experience with color, pattern, texture, as found in nature and arts. Three credits. One lecture and five hours lab. Fall, Sec. 1, M. W. F. 9 and 10. *Reynolds;* Sec. 2, M. W. F. 10 and 11. *Staff;* Sec. 3, M. W. F. 8 and 9, *Staff;* Sec. 4, T. Th. 2-5, *Staff;* Sec. 5, T. Th. 2-5, *Staff;* Sec. 6, M. W. 7-10 p. m., *Staff.* Winter, Sec. 1, T. Th. 2-5, *Staff;* Sec. 2, M. W. 2-5, *Thorpe;* Sec. 3, M. W. 7-10 p. m., *Staff.* Spring, Sec. 1, M. W. F. 8-10, *Thorpe;* Sec. 2, T. Th. 2-5, *Staff;* Sec. 3, T. Th. 2-5, *Staff;* Sec. 4, M. W. 7-10 p. m., *Staff.*

*On leave.

Art 2. Design and its Application. Designed to give students opportunity to develop skill in application of design principles to elementary craft problems as used in every day life. Students study simple constructive and decorative ideas adapted to their individual needs whether for home or school and on the level of their previous experience. Side by side many types of handicraft are pursued. Sections are limited to 20 students. Instruction is adapted to the needs of homemakers and teachers of handiwork on any level. Prerequisite, Art 1 or equivalent. Three credits. Fall, Sec. 1, Lecture, T. 2; Lab., T. Th. 2-5, Room M330-B, *Thorpe*. Winter, Sec. 2, Lecture, M. 9; Lab., M. W. F. 9 and 10, Room 330-C, *Reynolds*. Winter, Sec. 3, Lecture, M. 10; Lab., M. W. F. 10 and 11, Room 330-E, *Staff*. Winter, Sec. 4, Lecture T. 2; Lab., T. 3-5, Th. 2-5, Room M330-B, *Thorpe*. Spring, Sec. 1, Lecture, M. 8; Lab., M. W. F. 8 and 9, Room M330-E, *Staff*. Sec. 2, Lecture, T. 2; Lab., T. Th. 2-5, *Thorpe*.

3. Art Understanding and Appreciation. Designed to give an understanding of the basic principles underlying architecture, landscape gardening, interior decoration, sculpture, painting, the art of the book, pottery and other things met in everyday life today. The aim is to increase enjoyment through the sense of sight. Three credits. Fall, M. W. F. 8. Winter, M. W. F. 8. Spring, M. W. F. 8, Room 330-C. *Reynolds*

22 or 122. Home Planing, Construction and Design. House design, planning, garden planning, building construction, heating, lighting, plumbing, etc. How to select the type of house and supervise the construction and equipping of the home. Three credits. (Not given 1947-48.)

23 or 123. Interior Decoration. Design and color as applied to the furnishing and decoration of a home. Selection and styles in furniture, drapery, rugs, and all other problems relating to the creation of interiors of character and beauty will be considered. Prerequisites: Art 1 and 2. Five credits. Fall, M. T. W. Th. 1; Lab., F. 2-5. Spring, M. T. Th. F. 10; Lab., W. 2-5. Room 330-C. *Staff*

26 or 126. History and Appreciation of Architecture. The characteristics of the great styles of building and the development of a state for good architecture. Adapted to the needs of the homemaker, teacher, artist, or layman. Three credits. Winter, M. W. F. 11. Room 330-C. *Reynolds*

31. Commercial Art and Posters. Design in advertising display, layout, lettering, etc. Three credits. Fall, Lecture M. 2; Lab., M. W. F. 2-5. Room 330-B. *Thorpe*

32. Color. Color as used in stage lighting, painting, design, and everyday life. Its physical, psychological, and artistic phases are correlated. Suited to the business man, layman, dramatist, artist, teacher, and painter alike. Three credits. Spring, M. W. F. 9. *Reynolds*

33 or 133. History and Appreciation of Painting. Designed for the layman desiring to extend his knowledge of the great painters as well as for the teachers of art and artists. Three credits. Winter, M. W. F. 11. (Not given 1947-48.) *Reynolds*

34. Art for Young Children. Designed to meet the needs of child development majors, mothers in the home, kindergarten and first grade teachers. Two credits. Winter, T. Th. 12. Room 330-C. *Staff*

37. Principles of Industrial Design. Elect Art 1 for 1947-48.

38. Problems of Design. Elect Art 2 for 1947-48.

124. Perspective. The principles of cylindrical, parallel, oblique and modernistic perspective as used in the arts will be covered. Special attention will be given to rendering in pencil and pen and ink. Three credits. Room 330-E. Spring, M. W. F. 9. *Staff*

125. Anatomy and Figure Drawing. The anatomy and construction of the human figure with emphasis on superficial anatomy. Adapted to the needs of fashion artists, sculptors, painters, illustrators, commercial artists, and teachers. Three credits. May be taken without the lab., which is separate. Spring. (Not given 1947-48.)

125a. Laboratory in Figure Drawing. Spring, T. Th. 8-11. Two credits. May be taken alone. Room M330-D. *Staff*

127. Advanced Design. Advanced problems in design for crafts, industrial art, and mural decoration. Adapted to the needs of the teacher of applied art, textiles and industrial are on the secondary school level. Three credits. Winter, M. W. F. 12. *Staff*

129. Photography. Basic course for all who desire to do more effecient and artistic work. Three credits. Fall, Winter, and Spring, T. Th. 2-5. Room 331. *Reynolds*

130. Photography—Advanced Problems. Prerequisite: Art 129. Two credits. Fall, Winter, and Spring. M. W. 2-5. Room 331. *Reynolds*

Art 140. Aids in Blackboard Illustration. This course is designed for those who feel the need of increasing their abilities to illustrate their ideas quickly and effectively with chalk or charcoal. It should be of value to teachers of all age levels as well as demonstration agents in Agriculture and Home Economics. Two credits. Spring, M. W. 2-5. Room M330-D. *Staff*

151. Art Education for High School. Methods of teaching art on the secondary school level. How to motivate the work in drawing, painting, design and crafts. Arrangement of the shop, studio, selection of tools, and supplies, are all taken up. Required of all majors and minors in art on this level. Prerequisite, Art 1, 2. (Not given 1947-48.)

Art 152. Art Methods for Elementary Grades. Methods of teaching drawing, painting, design and handwork in the elementary schools. Creative expression, the integrated art program, how to use it to achieve desirable social outcomes and promote growth in knowledge, skills, proper habits and attitudes. A "must" in preparation of a grade school teacher. Prerequisite: Art 1 and 2 or equivalent amount of Art 104 and 114. Three credits. Winter, M. W. F. 9. Room M330-E. *Staff*

STUDIO COURSES

These courses are set up to give opportunity for all students to experience the thrill of creation as well as to give special help to the talented. All work is individual with several lines going side by side according to the special needs of each student. Direction and help is given during regular specified periods. Students will elect to do one to five credits of work in any line. Three hours of work in the studio is required during a week for each unit of credit. Any course may be repeated for further credit but more advanced problems must be pursued. Courses are open to junior college students. For courses receiving graduate credit, see head of department.

Art 20. Puppetry. Designing and making puppets; construction of puppet stage. Credit arranged. Fall and Spring, M. W. 2-5. *Reynolds*

Art 104. Creative Expression. A, drawing; B, painting; C, illustration. Students may specialize in any branch of drawing, painting, book illustration, applied costume illustration and costume design or commercial illustration. Credit arranged. Fall or Spring, M. T. W. Th. 2-5; Winter, Daily 2-5. *Fletcher.* Room M330-D. Fall, Winter, Daily 9-11. Spring, M. W. F. 10-12, T. Th. 9-11. Room M330-D. *Thorpe.* Open also to Freshmen and Sophomores.

A sketch class to work out of doors is arranged for Thursday afternoons during the Fall and Spring quarters. All 104 students are eligible for this class. Fall, Th. 2-5. Spring, Th. 2-5. *Fletcher*

A special afternoon with animal drawing is arranged for Tuesday afternoons during the Spring quarter. T. 2-5. Open to all 104 or 105 students. *Fletcher*

Special Portrait class will meet during the Winter quarter. Register for Art 104.

Art 105. Scientific Drawing, Painting. This work is coordinated with various scientific departments: A, Botanical; B, Zoological; C, Geological. Instructors in the science departments concerned may direct the content of the work done if desired. Credit and time arranged. Any quarter. *Fletcher*

Art 106. Creative Sculpture. A, carving in stone; B, carving in wood; C, modeling and casting. Credit arranged. Any quarter. Room 330-D. T. Th. 8-11. *Staff*

Art 110. Lettering and Commercial Art. A, show card writing; B, window sign and gold leaf; C, illumination and manuscript lettering. Fall, Winter, Spring, Daily 10-12. *Thorpe.* Fall, Winter, Spring, M. W. 2-5. Credit arranged. *Staff*

Art 111. Professional Design. A, textile and wallpaper; B, interior decoration; C, furniture and industrial design; D, house design and architectural composition. Prerequisite: Art 1 or equivalent. Any quarter. Time and credit arranged. Room 330-D. *Fletcher*

Art 112. Ceramics. A, pottery; B, china painting. Any quarter. Credit and time arranged. (Not given 1947-48.) *Staff*

Art 113. Art Metalry. A, copper, aluminum, and silver smithing; B, jewelry, including stone polishing. Credit arranged. Fall and Spring, M. W. 2-5. Winter, M. T. W. Th. 2-5, Room 330-E. Limited to metals obtainable. *Staff*

Art 114. Minor Crafts. A, leatherwork; B, basketry; C, polychrome and gesso; D, textile decoration, including block printing, stenciling, batik, etc. Credit arranged. Fall and Spring, M. W. 2-5. Winter, M. T. W. Th. 2-5. Room 330-E. *Staff*

Art 115. Graphic Art. A, etching; B, wood block printing or wood engraving; C, monotype or lithographic drawing; D, silk screen and paper stenciling. Fall, Winter or Spring, M. T. W. 2-5. Credit arranged. Room 330-D. *Staff*

Education

E. A. JACOBSEN, L. R. HUMPHERYS, JOHN C. CARLISLE, ..., *Professors;* C. E. MCCLELLAN, *Professor Emeritus;* EDITH BOWEN, LEE GRANDE NOBLE, EDITH SHAW, *Assistant Professors;* GEORGE S. BATES, ALVIN HESS, *Instructors.*

10. College and Life. Orientation course especially designed for freshmen but open to all students. Fall, Winter or Spring, M. W. 1; or T. Th. 8. Two credits. *Chase*

DIVISION OF ELEMENTARY EDUCATION

General requirements for the Bachelor of Science degree are listed on page 50. For a major in Elementary Education the student must complete at least 36 credits of professional work in Education and Psychology. The major field of study must be distributed approximately as follows:

(1) Nine credits in the field of understanding the child: Psy. 110, Psy. 130, C.D. 60, Bact. 155, Educ. 145 or other equivalent approved by the major professor.

(2) Six credits in principles of education and school administration: Educ. 103, Educ. 114, Educ. 116, Educ. 14.

(3) Six credits in curriculum and methods: Educ. 104, Educ. 105.

(4) Twelve credits in elementary school student teaching: Educ. 106.

Additional requirements are made up of courses in three groups:

(1) Courses designed to develop a broad liberal background. These must include ten credits in each of the four basic fields of knowledge: Social Science, Biological Science, Physical Science and Language Arts; and six credits in fine and practical arts.

(2) Thirty credits in one field of concentration or eighteen credits in each of two such fields.

(3) Fourteen credits chosen from the following related courses: Eng. 24, Art 152, P.E. 177, 182, Speech 18, 107, 154, Music 130.

Selection of the program of study should be under the guidance of the major professor. Completion of a major in Elementary Education includes all requirements for a Utah general Elementary Certificate.

103. Principles of Elementary Education. Deals with the aims, functions, work and attainable goals of the elementary school as an integral part of the American system of education; its relations with the community and the other schools of the American series. Part of the work of the course will be devoted to observation and analysis of practices and procedures in selected elementary schools within the vicinity of the College. Four credits. Fall or Spring, M. W. F. 9. Two hours of observation weekly. Time arranged.

104. Elementary School Curriculum. Designed to familiarize prospective elementary teachers with the content of the elementary curriculum, the objectives and standards to be realized in the grades, and to extend the student's scholarship in the various fields explored by pupils of the elementary school. Three credits. Fall and Winter, M. W. F. 10. *Bowen*

105. Principles of Teaching in Elementary School. The purposeful activity of the child as the basic principle determining teaching procedure. The purpose and meaning of subject matter in light of the foregoing thesis. Significance of the fact of individual differences in its application to schoolroom practices. Consideration of schoolroom equipment and of organization and play activity. Three credits. Any quarter, M. W. F. 8. *Shaw*

106. Practice Teaching. For juniors or seniors who have had Educational Psychology and Principles of Education. The apprentice plan is followed which requires an initial period of observation with minor responsibility but with gradual increase of work and responsibility as trainee's ability is demonstrated. Registration for all quarters should be arranged for at the time of fall registration. Twelve credits. Any quarter, time arranged. Students who have credit for other courses in practice teaching, or who have successful teaching experience, may register, by special permission of the instructor, for less than 12 credits. *Shaw and Supervising Teachers*

107. The Teaching of Reading. Objectives, standard of attainment, and methods of reading instruction; diagnostic and remedial techniques at the elementary and secondary level; reading in the activity program. Three credits. Winter, M. W. F. 10.

108. Social Studies in the Public School. A consideration of the social responsibilities and opportunities of children and youth in the present and postwar world. The part that should be played by the school and the teacher in helping boys and girls to meet these problems will be studied. This will deal with both content and methods in social studies for the public schools. Three credits. Fall, M. W. F. 10. *Staff*

110. Diagnostic and Remedial Teaching. A consideration of the specific objectives of the elementary school and methods of analyzing the extent to which these objectives are reached. Diagnostic and remedial measures with respect to various areas of the curriculum will be studied. Two credits. Spring, T. Th. 9. *Staff*

114. Organization and Administration of Education. (See Division of Theory and Administration.)

165. Rural Education. An overview of the major problems of rural life as they relate to education. The adaptation of general educational objectives to rural conditions, especially as they pertain to Utah. The organization of rural schools, the course of study, and methods in education suited particularly to the rural school problems on both elementary and secondary levels. Two credits. Winter, T. Th. 9. *Jacobsen*

201. Background of Modern Education. (See Division of Theory and Administration.)

Educational Psychology. (See Psychology 102a.)

Application of Statistics to Education and Psychology. (See Psychology 102b.)

Child Psychology. (See Psychology 110.)

Psychology of the Elementary School Curriculum. (See Psychology 112.)

Clinical Psychology. (See Psychology 103.)

Psychology of Learning. (See Psychology 107.)

DIVISION OF SECONDARY EDUCATION

JOHN C. CARLISLE, *Chairman.*

For a major in Secondary Education the student must complete at least 36 quarter hours of professional work in Education and Psychology. The major field of study must be distributed approximately as follows:

(1) Nine credits in the field of understanding the child: Psy. 102a, Psy. 103a, Psy. 103c, Educ. 113.

(2) Six credits in principles of education and administration: Educ. 110, Educ. 111 or 112, Educ. 114, Educ. 116, Educ. 141.

(3) Fifteen credits in student teaching and methods: Educ. 115, Educ. 127, Educ. 129a, Educ. 129b, Educ. 161; Art 151; P.E. 192; Music 121, 122, 123; Eng. 123; Psy. 107.

Note: Courses other than Education and Psychology may be elected only by students with teaching majors in these specific fields.

A teaching major of not less than 30 credits, of which 15 credits must be Upper Division, and a teaching minor of 18 credits in subjects taught in high schools are required of majors in secondary education. In lieu of a teaching major and minor, a composite teaching major may be selected. Such a major consists of not less than 60 credits in two or more related subjects with a minimum of 18 credits in any field included in the composite major. At least one half of the work must be of Upper Division grade. Composite majors are offered in the following fields: Social Science, Language Arts, Physical Science and Mathematics, Biological Science, Commercial Education.

Health Education (Bact. 155 or equivalent) is required.

Selection of a program of study should be under the guidance of the major professor. Completion of a major in Secondary Education includes all requirements for a Utah general Secondary School Certificate.

Educational Psychology and Application of Statistics to Education and Psychology. (See Psychology 102a and 102b.)

111. Principles of Secondary Education. Problems and principles involved in the learning process; relationships between learner, subject matter, and method; objectives, motivation, direction, discipline, evaluation and other fundamental considerations. Prerequisites: Educational Psychology. Three credits. Any quarter, M. W. F. 8. *Carlisle*

113. Occupational and Vocational Guidance. (See Division of Vocational Education.)

114. Organization and Administration. (See Division of Theory and Administration.)

115. Secondary School Curriculum. Deals with the nature and function of the curriculum. Different viewpoints respecting the curriculum, and examples of new type curricula now attracting attention in various parts of our country, are examined and evaluated. Three credits. Spring, T. Th. 8, W. 4. *McClellan*

116. Articulation of the Educational Program. (See Division of Theory and Administration.)

123. The Teaching of English. A practical course planned for those who are either teaching or planning to teach English in public schools. The purpose is to study both materials and methods in the three fundamental areas of English instruction: grammar, composition, and literature. Three credits. Fall, M. W. F. 11. *Hayward*

127. Classroom Management and Technique. This course, to be taken along with Education 129a, considers such factors in the teaching process as: personality of the teacher, planning instruction, study procedures, types of teaching, adapting classroom practices to individual differences, discipline, evaluation. Two credits. Any quarter, T. Th. 8. *Carlisle, Noble*

129 a and b. Practice Teaching in the Secondary School. Required for certification. Students are enrolled only after they have completed Psychology 102, Education 111, and at least eighteen credits in the field in which they expect to do practice teaching. Education 127 must be taken during the same quarter.

Ordinarily, a full afternoon daily is required for the class. The apprentice plan is followed in which the student is assigned to a helping teacher in the secondary school. A brief period of observation is followed by gradually increasing responsibilities until the student teacher by the end of the quarter has had guided experience in all the professional responsibilities of the typical faculty member in the junior or senior high school. Eight credits. Any quarter. *Carlisle, Noble*

145. Safety Education. Emphasizes (a) the needs for safety education in the modern world; (b) the role of the school in a program for safety; (c) methods and materials for teaching discussions, and readings, stressing various aspects of safety and directed by safety specialists from many areas. Two credits. Winter and Spring, T. Th. 10. *McClellan*

161. Audio-Visual Aids in Education. Emphasizes the importance of audio-visual aids in the school program. Building a workable program in which are utilized the newest materials and techniques. Three credits. Fall, M. W. F. 8. *Noble*

201. Background of Modern Education. (See Division of Theory and Administration.)

241. Social Education. (See Division of Theory and Administration.)

107. The Teaching of Reading. (See Division of Elmentary Education.)

108. Social Studies in the Public School. (See Division of Elementary Education.)

123. The Teaching of English. (See English 123.)

151. Art Education for High School. (See Art 151.)

179. Methods of Teaching Typewriting. (See Secretarial Science 179.)

180. The Teaching of Stenography. (See Secretarial Science 180.)

237. Problems in Secondary Education. Designed for graduate students in secondary education and those preparing for school administration or supervision at the junior-senior high school levels. The course deals with a review of research in the field together with emphasis upon those areas of particular concern to members in the class. Three credits. Winter, T. Th. 9, W. 1. *Carlisle*

Three credits earned in methods courses in any of the following fields may be counted toward certification by majors in these fields.

DIVISION OF VOCATIONAL EDUCATION

L. R. HUMPHERYS, *Chairman.*

Candidates for a teacher's certificate in the several fields of Vocational Education need to comply with the Utah certification requirements. The following courses are suggested:

Agriculture Basic: Psychology 102a, 102b; Education 112, 113, 114, 125, 126; Bacteriology 155; Elective 3 credits.

Home Economics Basic: Psychology 102a, 102b; Education 114, 120, 121 122a; Bacteriology 155; Elective 7 credits.

112. Principles of Vocational Education. A consideration of the social and economic bases for vocational education and its relation to general education. Fundamental principles and practices in vocational education. Three credits. Winter. Time arranged. *Humpherys*

113. Vocational Guidance. An analysis of individual and occupational differences, a consideration of available tests, measurements, and other devices for determining individual difference, individual and group counseling, and organization of guidance service. Prerequisite: Psych. 102. Three credits. Fall, Winter, M. W. F. 8. Spring, M. W. F. 10. *Humpherys and Carlisle*

114. Organization and Administration of Education. (See Division of Theory and Administration.)

116. Articulation of the Education Program. (See Division of Theory and Administration.)

120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; an appreciation of methods of teaching in education for home and family living. Prerequisite or parallel: Psych. 102a, 102b. Three credits. Fall, Spring, T. Th. S. 8. *Cawley*

121. Problems in Teaching Home Economics. Study of recent investigations in Home Economics and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) It is suggested that this course be blocked with Education 122a and with one other three-hour Education* course so that concentrated work may be participated on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. Four credits. Winter, Spring. Time arranged. *Cawley*

122a. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with College. Student teachers leave the campus the middle five or six weeks of Fall or Winter Quarter and teach a full homemaking program each day in one of the approved schools. An occasional student may find it impossible to do the student teaching on this block plan. Such a student must receive approval of the instructor of Education 121 and 122a, preferably at the beginning of her junior year, to make other arrangements for her student teaching. In the latter case, the student teacher will teach at least two hours daily in an approved local school in Spring. Prerequisite: Education 120 and Education 121. Eight credits. Winter, time arranged. *Cawley*

122b. Student Teaching in Home Economic for Non-Vocational Education Majors. For student dietitians whose responsibilities will involve teaching student nurses, student dietitians, and patients. For other non-vocational homemaking education majors who are interested in securing practical teaching experience. In Spring the student teacher will teach at least one hour daily in an approved local school. Prerequisite: Education 120 with Education 121 taken the same quarter as Education 122b. Four credits. Spring, time arranged. *Cawley*

Field Trip. For senior girls and graduate students enrolled in homemaking education. Trip will be planned cooperatively by students and homemaking education staff. Trip will probably take place during Spring quarter, and the estimated cost will be given in advance.

***124. Methods of Teaching Farm Mechanics.** Scope of mechanics in agriculture, lesson planning, course of study preparation, shop equipment and management, skill requirements, and supervised practice. Five credits. Time arranged. *Humpherys*

*It is necessary to make arrangements for specific Education course with major professor at the time when plans are being made for Education 121 and 122a.

*125. **Methods of Teaching Agriculture.** For teachers of vocational agriculture. Fundamental principles and practices of teaching, selection, and organization of subject matter and supervision of agricultural activities on the farm. Five credits. Winter. Daily 9. *Humpherys*

126. **Directed Teaching in Agriculture.** Student observation and teaching in approved local vocational agricultural departments under supervision. Trainees will be expected to leave the campus to train in selected high schools of the state for a full teaching program. Four to eight credits. Winter, and Spring. Time arranged. *Humpherys*

199. **Special Problems in Home Economics Education.** Developed around individual needs of students which are not otherwise provided for in curriculum. One to two credits. Any quarter. Time arranged. *Cawley*

210. **Research for Master's Thesis.** Credit arranged. *Cawley*

225. **Special Problems in Agricultural Education.** A consideration of needs of individual students and special types of service. One to two credits. Spring. Time arranged. *Humpherys*

226. **Organization of Adult Instruction.** The fundumental concepts in the organization and instruction of adults, principles and techniques of teaching adult classes. Three credits. Spring. Time arranged. *Humpherys*

DIVISION OF THEORY AND ADMINISTRATION

E. A. JACOBSEN, *Chairman.*

114. **Organization and Administration.** Fundamental principles of organization and administration of schools in the American public school system of education with special emphasis on Utah conditions. Three credits. Fall and Winter, M. W. F. 10. *Jacobsen*

116. **Articulation of the Educational Program.** A survey of existing needs for close articulation of the various educational units and agencies. Discussion of the factors conditioning nature and extent of articulation and of the unifying principles upon which a well articulated education program rests. Three credits. Fall and Spring, M. W. F. 2. *Jacobsen*

141. **Social Education.** The implications for education involved in social conditions and social change. The social significance of current educational theories and practices. Three credits. Winter, T. Th. 8, W. 3:30-4:30. *Noble*

181. **School Finance.** A study of the importance of finances in a school system and the principles and practices involved in the collecting and distributing of school revenues, with special deference to the conditions in Utah. Two credits. Fall, T. Th. 11. *Jacobsen*

201. **Background of Modern Education.** An integration of the history and philosophy of education as a basis for understanding modern education. The evolution of educational thought, the sources of great philosophies of education in relation to their times. Five credits. Fall, Daily 10. *Noble*

203. **Evaluating the Elementary School.** Studies evaluating the changing elementary school are analyzed. Particular attention is given to organization and curriculum. Newer methods utilized in evaluation are considered. Enrollment open only to experienced teachers or prospective teachers who have completed their courses in practice teaching. Three credits. Winter, M. W. 4:30 to 6. *Carlisle*

205. **Reading and Conference.** Provides for individually directed study in the fields of one's special interest and preparation. One or two credits per quarter. Any quarter. Time arranged. *Staff*

211. **Educational Measurement and Statistics.** The fundamental principles of measurement tests and test construction, statistical analysis, and evaluation procedures in education. Five credits. Winter, Daily 9. *Humpherys*

*Approval of instructor is necessary before student is accepted.

219. The Principal and His School. Practical problems confronting the principal in administration and supervision, in terms of the changing social scene and changing concepts of school administration. Problems of administration, supervision, curriculum, pupil personnel, school-community relations, as they apply to the work of the principal all are given consideration. Three credits. Winter, M. W. F. 2. *Carlisle*

221. Advanced School Administration. A general study of the work of the school administrator and the principles upon which the profession of school administration is founded and efficiently practiced. Consideration is given major educational problems with which the school administrator is confronted. Three credits. Spring, M. W. F. 9. *Jacobsen*

237-8-9. Educational Seminar. Gives apportunity for the investigation and report of individual problems and for group discussion and criticism on these reports. Minimum of one quarter required of all Education majors. Any quarter. Time and credit arranged. *Staff*

267. Introduction to Research. An inquiry into the nature and sources of research problems with a study of underlying principles and methods of working out such problems in education. Some attention is given thesis writing as a problem related to research. Two credits. Winter. Time arranged. *McClellan*

271. Research and Thesis Writing. Provides for individual work in thesis writing with the necessary guidance and criticism. Any quarter. Time and credit arranged. *Staff*

DIVISION OF LIBRARY SCIENCE

KING HENDRICKS, *Chairman.*

Library Science may be used as a teaching major or minor in connection with a major in Education. The major shall consist of not less than 30 credits and the minor of not less than 18 credits chosen from the following courses:

1. The Use of the Library. A general course designed to help students to become efficient in using books and libraries. Emphasis will be placed upon use of card catalog, periodical indexes, and reference books. Two credits. Fall, and Winter, T. Th. 8 or M. W. 8. *Staff*

100L. Reference Materials and Bibliography. A continuation of work done in The Use of the Library, which course is a prerequisite to this one. Principal reference tools in each field are studied. Winter, M. W. F. 8. *Staff*

113L. Book Repair and Binding. Methods of book repair, necessary bindery records, and the history of book binding. Two credits. Spring, T. Th. 9. Laboratory to be arranged. *Staff*

120L. First Quarter Cataloging and Classification. Classification of books according to the Dewey decimal system and cataloging instruction adapted primarily to the use of school and public libraries. Three credits. *Staff*

121L. Second Quarter Cataloging and Classification. A continuation of the work undertaken in Library Science 120L which is a prerequisite to this course. Three credits. *Staff*

150L. School Library Administration. A study of the theory of school library work with special emphasis placed on demonstration and practical application. Three credits. Spring, M. W. F. 8. *Staff*

155L. Book Selection. Methods and principles of book selection and book ordering. Three credits. Time arranged. *Staff*

160L. The Art of the Book. The history of bookmaking and printing. One credit. Time arranged. *Staff*

Teaching of Reading. (See Division of Elementary Education 107.) Three credits.

Children's Literature. English 24. Four credits.

Speech 18. Five credits.

The Department of Education offers majors in elementary and in secondary education on the undergraduate level together with professional education courses required for certificates in Vocational Agriculture and Vocational Home Economics.

GRADUATE WORK

Graduate study in the Department of Education leads to the Master of Science degree in Education or to the Five Year Diploma. All courses listed in the department are applicable to either the degree or the diploma with the exception of the following: Educ. 103, 104, 105, 106, 114.

Music

N. WOODRUFF CHRISTIANSEN, *Professor, Chairman, Instrumental Division;* WALTER WELTI, *Professor, Chairman, Vocal Division;* GEORGE PAHTZ, ..., *Instructors.*

Courses in the Music Department are designed to, (a) serve the general cultural needs of all students, (b) meet the major and minor requirements of prospective teachers.

The department is also a valuable service department; individuals, groups, and organizations fill a constant and urgent need in the neighboring schools and communities.

Music 1, 4, 5, 11, 12, 13, 80, 81, 89, may be used for Lower Division group requirements.

Vocal Music Major. For this major the following courses are required: Music 1, 4, 5, 11, 12, 13, 106, 114, 121, 122, 123, 124, 125, 126, 130. Majors are required to present a creditable solo recital in the junior or senior year, as prescribed by the major professor; also to play third grade piano music at sight. The following allied subjects are recommended: Oral Expression, Creative Dancing, a year of foreign language. Modern Language 21, 22, and 23 are required, except of students already trained in them. (See Modern Languages 21, 22, 23.)

Instrumental Music Major. To complete this major with recommendation to teach band and orchestra, the following courses are required: Music 11, 12, 13, 111, 112, 113, 114, 70, 71, 72, 80, 81, 121, 122, 123, (121, 122, 123 must be taken before practice teaching) three or more quarters of symphony orchestra, six or more quarters of band as prescribed by the major professor, three quarters or equivalent of piano, sufficient private instruction or equivalent on a band or orchestra instrument for a creditable solo performance, one quarter each private instruction, or equivalent, on a string instrument, a brass instrument, and a reed instrument.

For a music major without recommendation to teach band and orchestra, consult the major professor.

In 1936 the College was awarded a complete Carnegie music set containing 2,000 recordings, 150 bound scores, and 100 selected books on music. This material, together with many additions made since that time, is available to students and is used in the music courses.

Piano Major. Provisions are made for a major in piano music. Supplementary courses may be selected from music theory, vocal music and instrumental music under the direction of the piano instructor.

1. The Art of Listening. Designed to enhance the general listener's appreciation of music through the use of selected reproductions, though non-technical, collateral reading and reports will be assigned. Three credits. Fall, M. W. F. 9. *Welti*

4. Sight Singing. Notation, scales, intervals and keys in major and minor modes, and their applied use in reading music. Three credits. Fall, M. W. F. 10 *Welti*

5. Dictation. Translating musical sounds into written notation. Writing melodies, intervals and chords from dictation. Prerequisite: Music 4 or equivalent. Three credits. Winter, M. W. F. 10. *Welti*

7, 8, 9. Elementary Class Piano Instruction. For students without previous work in piano. General keyboard facility. Sight reading of folk tunes and the easier classics; harmonizing melodies by ear. Recommended for prospective teachers in the elementary schools. One and one-half credits each quarter. Fall, Winter and Spring, M. W. F. 3. *Staff*

11, 12, 13. Harmony. Prerequisite: Familiarity with the piano keyboard. Chord structure and progressions, to and including modulations, melody writing and musical analysis. Three credits each quarter. Fall, Winter and Spring, M. W. F. 10. *Christiansen*

15, 16, 17. String Ensembles. Offers an opportunity for capable string players and pianists to organize into trios, quartets, and other small units. Fall, Winter and Spring. Ensemble Th. 12, one half credit. Any other group, one half credit with time arranged. *Pahtz*

18, 19, 20. Symphony Orchestra. Provides training and practical experience in a wide range of orchestral work. Students are required to play at all public appearances of the orchestra. One and a half credits each quarter. (See 118, 119, 120.) Fall, Winter and Spring. M. T. W. F. 12. *Christiansen*

24, 25, 26. Men's Chorus. Open to all men students with a normal singing voice. Auditions to determine the part you sing will be announced at rehearsal. Men and women join in mixed chorus work each Friday. Auditions are required before registering in the Winter quarter only. One credit each quarter. Fall, Winter, Spring, M. W. F. 1. *Welti*

27, 28, 29. Ladies' Chorus. Open to all women students with a normal singing voice. Auditions to determine the part you sing will be announced at rehearsal. Women and men join in mixed chorus work each Friday. Auditions are required before registering in the Winter quarter only. One credit each quarter. Fall, Winter, Spring, T. Th. 1. *Welti*

35, 36, 37. Vocal Groups. Offers an opportunity for good voices to organize into trios, quartets, and other small units. One credit each quarter. Fall, Winter and Spring. Time arranged. See instructor before registering. *Welti*

38. Music for Little Children. Methods of procedure in teaching music to children of pre-school age. One credit. Fall. Th. 11. *Welti*

41, 42, 43. Band. This organization is the College Concert Band. It includes the R. O. T. C. Band and all other students who qualify. Concerts will be given and music furnished for athletic events. State tour end of Winter quarter. Members are required to play at all public appearances of the band. One credit each quarter. (See 141, 142, 143.) Fall, Winter, Spring, Daily 1. *Christiansen*

R. O. T. C. Band. Band men who are required to take Military Science should register for Military Science and then ask to be assigned to the R. O. T. C. Band.

44, 45, 46. Brass and Reed Groups. Brass quartets, sextets, and woodwind quartets. Members will be selected from applicants. One-half credit each quarter. Fall, Winter, Spring, Time arranged. *Christiansen*

47, 48, 49. Composition and Analysis. Practical composition in the small forms from the extended period to the song form with trio. Prerequisite: At least one year of harmony. Two credits each quarter. Fall, Winter and Spring, T. Th. 9. *Staff*

72. Principles of Singing. A study of vocal functions, causes of poor tone production, and means of correction. Results are measured through individual and ensemble singing in class. Recommended for teachers. Two credits. Spring, T. Th. 10. *Welti*

80. Opera Appreciation. An intensive study is made of the world's best operas. Particular attention is given to the development of the orchestra as an essential part of the opera. By means of recordings the choicest musical selections are learned. Two credits. Fall or Spring, T. Th. 3. *Christiansen*

81. Symphony Appreciation. Complete symphonies are given by the phonograph method. A careful study is made of their form and content. Two credits. Winter, T. Th. 3. *Christiansen*

87. Musical Literature for String Instruments. A non-technical course. A study is made by the use of recordings of standard concerts, trios, quartets and quintets. Also biographical sketches of composers and performers. Two credits. Fall, Winter or Spring, T. Th. 10. *Pahtz*

89. Bach, Beethoven and Brahms. Their lives and works, their influence upon the development of music, and the influence upon their music of the times in which they lived. Two credits. Spring, T. Th. 10. *Staff*

106. History of Music. The development of music from its varied inceptions to the present. Lives of the most prominent composers. Effects of history on the development of music. (Not open to Freshmen.) Three credits. Fall, M. W. F. 10. *Welti*

108. Keyboard Harmony. Drills, employing triads, seventh chords and their inversions. Harmonization of melodies, improvisations, and modulation, transposition. Prerequisite: Music 11, 12, 13. Three credits. Spring, M. W. F. 10. *Staff*

111, 112, 113. Advanced Harmony. Prerequisite: Music 11, 12, 13. Modulation, embellishing chords, inharmonic embellishments and figurations, analysis. Three credits each quarter. Fall, Winter, Spring, M. W. F. 9. *Christiansen*

114. Techniques of Conducting. The art and technique of effectively selecting, organizing and conducting group music. Style in expression. Use of the baton. Not open to freshmen. Three credits. Spring, M. W. F. 10. *Welti*

117. Opera Production. A thorough study of the details involved in the production of opera. Students are assigned definite responsibilities in the preparation and presentation of opera. Consult instructor before registering. Two credits. Winter, M. W. F. 11. *Welti*

118, 119, 120. Symphony Orchestra. Senior College credit is given students of advanced standing. Prerequisite: Two years in Orchestra. One and one-half credits. Time as for Music 18, 19, 20. *Christiansen*

121, 122, 123. Band and Orchestra Methods. A study of the various band and orchestra instruments, and the essential points in the teaching of them. Designed for students who may teach elementary bands and orchestras or who intend to follow music as a profession. This course must precede practice teaching in instrumental music. Prerequisite: General knowledge of music and average proficiency on at least one instrument. Fall—brass instruments; Winter—reed instruments; Spring—string instruments. Three credits each quarter. Fall, Winter and Spring, Daily 2. *Christiansen*

124, 125. Advanced Chorus. For juniors and seniors who have had choral experience. One credit each quarter. Fall and Spring. Men, M. W. F. 12. Ladies, T. Th. F. 12. *Welti*

127, 128, 129. Opera Staging. Open only to the opera cast and their understudies. Selections are made in the Fall through competitive tryouts open to all students. Intensive study and rehearsing begins immediately after these selections are completed. Three credits. Winter. Afternoons and evenings as arranged. *Welti*

126. Opera Chorus. Winter. Daily 12, and evenings as required. Two credits. *Welti*

130. School Music Methods. Methods of teaching music in the grades. Prerequisite: Music 4 and 5, or Music 11 and 12. No exceptions made to this rule. Three credits. Spring, M. W. F. 11. *Welti*

134. Counterpoint. Prerequisite: Harmony 13. Strict contrapuntal composition in all five species, in two, three, and four parts. Three credits. Fall, M. W. F. 11. *Staff*

135. Counterpoint. Strict and free counterpoint; a study of inventions and their composition. Three credits. Winter, M. W. F. 11. *Staff*

141, 142, 143. Band A. Rehearsals to be held jointly with 41, 42, 43. Senior College credit will be given students of advanced standing. Prerequisites: Two years of band. One credit each quarter. Fall, Winter and Spring, Daily 1. *Christiansen*

SPECIAL SERVICE COURSES FOR MUSIC MAJORS

21. French Pronunciation. Designed primarily for students in Music, Art, Speech and Radio. Available to others. Basic drill on pronunciation with special attention to the terminology and proper names encountered in Music and Art. Two credits. Winter, T. Th. 1. *Jensen*

22. Italian Pronunciation. Same as for course 21. Fall. *Jensen*

23. German Pronunciation. Same as for course 21. Spring. *Jensen*

PRIVATE INSTRUCTION COURSES

The following courses are given through private study only. Appointments and fees must be arranged with the instructor whom you select.

Note: Students taking one lesson a week in any private music study, and getting the required amount of practice and preparation, shall register for one and one-half credits per quarter. Students taking two lessons and getting the required amount of practice and preparation shall register for three credits per quarter.

Note: Written departmental approval must be secured on registration cards if the student plans to take private instruction from anyone other than a member of the regular resident staff. The Department reserves the right to reject credit if departmental standards are not met.

50, 51, 52. Piano. For students having less than two full years of piano instruction and for Lower Division students. *Staff*

53, 54, 55. Vocal. Conditions same as for piano. *Welti*

56, 57, 58. Wind Instruments. All the wind instruments of the band and orchestra. For students having less than two full years of previous training. *Christiansen and Associates*

60, 61, 62. Violin. For students having less than two full years of previous training and for Lower Division students. *Christiansen and Associates*

63, 64, 65. Cello. For students having less than two full years of previous training and for Lower Division students. *Pahtz*

66, 67, 68. Pipe Organ. Conditions same as for piano. *Clark and Associates*

150, 151, 152. Piano. For students recommended by an approved teacher, and satisfying the departmental standards for the equivalent of two full years of previous study. *Staff*

153, 154, 155. Vocal. For advanced vocal students. *Welti*

156, 157, 158. Wind Instruments. For students satisfying the departmental standards for the equivalent of two full years of previous study. *Christiansen and Associates*

160, 161, 162. Violin. For students recommended by an approved teacher and satisfying the departmental standards for the equivalent of two full years of previous study. *Christiansen and Associates*

163, 164, 165. Cello. For students recommended by an approved teacher and satisfying the departmental standards for the equivalent of two full years of previous study. *Pahtz*

166, 167, 168. Pipe Organ. For advanced pipe organ students. *Clark and Associates*

Physical Education and Recreation

H. B. HUNSAKER, W. B. PRESTON, *Professors;* J. K. VANDERHOFF, ISRAEL HEATON, ELIZABETH DUTTON, MARY E. WHITNEY, *Assistant Professors;* VAUGHN HALL, SHIRLEY NELSON, *Instructors.*

INTERCOLLEGIATE ATHLETIC STAFF

E. L. ROMNEY, *Professor, Director Athletics;* JOSEPH E. WHITESIDES, HOWARD B. LINFORD, PAUL MARSTON, *Assistant Professors;* MARVIN T. BELL, GEORGE NELSON, *Instructors.*

SERVICE COURSES

In the service courses of this Department, an opportunity is given each student to perfect skills in some form of physical activity which will help establish a permanent interest in healthful recreation of the active as well as passive type, the promotion of physical fitness, the building of morale, and the maintenance of health.

A physical examination is given to all students at the beginning of each year in order to advise them properly as to the type of activity best suited to their individual needs.

Women students are required to take physical education service courses for six quarters. Work may be selected by the student; and the same numbered courses may not again be taken for credit. Before a student may enter an intermediate or advanced course, in any activity in which she has completed and received credit for the elementary course, minimum service course requirements must have been satisfactorily completed.

It is recommended that all male students take some activity course in Physical Education. A wide range of courses in aquatics, dual, team, individual and outing activities are offered each quarter. Credit in Physical Education will count towards a college degree.

INTRAMURAL SPORTS

Intramural sports are conducted as a part of the program of the Department of Physical Education and Recreation. The Women's Athletic Association, in cooperation with the Women's Division of the department, sponsors and offers a wide and varied program of activities. All women students are eligible and encouraged to participate in any or all of the sixteen sports offered during the year. Women's intramurals strive to provide "a sport for every girl and a girl for every sport."

The department carries on an extensive organized Intramural sports program for men. Competition in 12 to 16 sports is carried on in four separate leagues, fraternity, department, club, and all-campus. All male students are eligible and encouraged to participate in one of these leagues. Students who have qualified through the Physical Education Department for "preferred rating," may receive Physical Education credit for Intramural sports.

The function of the intramural program is to give every student moral, social, physical, and educational values derived from competitive athletics. The program of athletics provides for both individual and team endeavor, "athletics for all," which is the purpose of the establishment of intramural sports.

RECREATION

The Department of Physical Education and Recreation aims to meet the recreational needs and interests of every student whether he is being trained in agriculture, engineering, business, or other professional fields.

This department will try to prepare the future farmer, banker, teacher or doctor for wise use of his leisure time. After courses in this department, students should be so interested in recreation that they will be valuable aid to any community.

Awards will be given to managers of various recreational groups and individual awards for special achievement. There will be groups organized in hiking, water sports, winter sports, tap dancing, fencing, archery, horse shoes, tennis, golf, badminton, boxing, swimming, tumbling and social dancing.

PROFESSIONAL COURSES IN PHYSICAL EDUCATION AND RECREATION

Because of the great demand for trained leaders in physical education and recreation, this department offers an opportunity to obtain a major or a minor in either field and also to meet the state requirements for certification of teachers of physical education and coaching positions. Curricula are offered which lead to qualification in the following positions: Community Recreation and Playground Manager, Coaches in Secondary School, Director of Physical Education in Secondary School, Teacher of Physical Education in Secondary and Elementary School, and Special Teacher or Physical Education in the Elementary School.

INTERCOLLEGIATE ATHLETICS

Intercollegiate athletics, inspired by the highest ideals and conducted on a high plane, provide an excellent course in training for citizenship and the preparation to wrestle with life's problems.

In high schools and colleges Competitive Athletics become a great factor for student body consciousness and oneness, and an outlet for great enthusiasm born of loyalty. They pay dividends in good health, physical development, and such manly qualities as courage, self-control, and the spirit of cooperation.

Every student at the College is given an opportunity to try-out for the various teams. Attractive schedules with teams representing other colleges are arranged in football, basketball, track and field, swimming, wrestling, tennis, golf and skiing.

The College has an attractive Stadium where the games are played, and the Field House seats 3,500 people for basketball contests. It also provides practice areas for other teams.

A splendid spirit of cooperation exists between the Intercollegiate Athletic Department and the Department of Physical Education and Recreation, proper.

THE COLLEGE HEALTH SERVICE

The Health Service is maintained primarily for the care of students who may become ill during their stay on the campus. This service is also looked upon as an educational department to teach preventive medicine and hygiene. Through consultations, examinations, and advice it attempts to point out the causes of ill health, and to present clearly the fundamental laws of good health.

SERVICE COURSES FOR MEN

2. Football. One credit. Fall. Daily 4. *Romney*

4, 5. Boxing. One credit each quarter. Fall and Winter, T. Th. 12; Spring, T. Th. 1. *Staff and G. Nelson*

7, 8. Wrestling. One credit each quarter. Fall, Winter, Spring, M. W. F. 1. *G. Nelson*

12. Track. One credit. Winter, Spring, Daily 3-5. *Linford*

13, 14, 15. Handball. One credit each quarter. Fall, Winter, Spring. Time arranged. *Staff*

16, 17, 18. Swimming. One credit each quarter. Fall, Winter, Spring. Sec. 1, T. Th. 10; Sec. 2, M. W. 10; Sec. 3, T. Th. 1. *Vanderhoff*

23, 24, 25. Basketball. One credit each quarter. Fall, Sec. 1, M. W. F. 2; Sec. 2, M. W. F. 3; Sec. 3, M. W. F. 8. Winter, Sec. 1, M. W. F. 11; Sec. 2, M. W. F. 3; Sec. 3, M. W. F. 8; Spring, M. W. F. 3. *Staff and Lee*

26, 27, 28. Restricted Gymnastics. This course for students physically unable to take required physical education. Students may register only after consultation with head of department. One credit each quarter. Fall and Winter, Sec. 1, M. W. F. 12; Sec. 2, T. Th. 12; Spring, M. W. F. 1. *Staff*

29. Sigma Delta Psi. One credit. Winter, M. W. F. 3. Spring, M. W. F. 3. *Heaton*

37, 38. Tumbling-Gymnastics. One credit each quarter. Fall, Winter, and Spring, M. W. F. 11. *Heaton*

187. Advanced Swimming. Prerequisite: P.E. 16, 17, 18. One credit. Fall, Winter, Spring, Sec. 1, M. W. F. 3. *Vanderhoff*

SERVICE COURSES FOR WOMEN

39. Speed Ball. One credit. Fall, M. W. 12. *Staff*

40. Volleyball. One credit. Fall, Sec. 1, M. W. 8; Sec. 2, T. Th. 8. *Staff*

42. Softball. One credit. Spring, M. W. 12. *Staff*

43. Field Hockey. One credit. Spring, T. Th. 12. *Staff*

44. Tumbling and Stunts. One credit. Spring, T. Th. 1. *Dutton*

45, 46, 47. Restricted Activities. For students physically unable to take the required work in physical education. Students may register only after consultation with the head of the department. One credit each quarter. Fall and Winter, M. W. F. 12; Spring, M. W. F. 11. *S. Nelson*

48. Elementary Modern Dance. Fundamental movement techniques, elements of rhythmic, and musical patterns, materials of design and composition, original composition of dance forms, history of the dance. One credit. Fall, M. W. F. 9; Winter, M. W. F. 11; Spring, M. W. F. 9. *S. Nelson*

49. Intermediate Modern Dance. Prerequisite: P.E. 48 and satisfactory completion of minimum service course requirements. Further practice and development in modern techniques and composition. One credit. Winter, T. Th. 2; Spring, T. Th. 10. *Whitney*

51, 52, 53. Elementary Swimming. One credit each quarter. Fall, Winter, Spring, Sec. 1, M. W. 12; Sec. 2, T. Th. 12; Sec. 3, M. W. 11; Sec. 4, T. Th. 3. *Dutton*

50. Advanced Modern Dance. Prerequisite: P.E. 48, 49 and consent of instructor. Further practice and development in techniques and composition of modern dance. One credit. Spring, M. W. F. 11. *Whitney*

55. Body Conditioning and Physical Fitness. Theory and practice of body conditioning. One credit. Fall, T. Th. 2. Winter, T. Th. 9. Spring, T. Th. 10. *Staff*

56. Intermediate Swimming. Prerequisite: P.E. 51, 52, 53, and satisfactory completion of elementary minimum service course requirements. One credit. Fall, Winter, Spring. Sec. 1, T. Th. 2; Sec. 2, T. Th. 1. *Dutton*

58. Rifle. One credit. Fall and Spring, M. W. F. 9. *Staff*

59. R. O. T. C. Sponsor. One credit. Winter, T. Th. 1. *Staff*

78. Track and Field for Girls. One credit. Spring, M. W. 2. *Staff*

154. Advanced Swimming. Prerequisite: P.E. 51 and P.E. 56, and satisfactory completion of minimum service course requirements in both courses of a senior life saving certificate. One credit. Fall and Winter, M. W. 9. *Staff*

SERVICE COURSES FOR MEN AND WOMEN

1. Hiking. One credit. Fall and Spring, Sec. 1, T. 3-5. *Staff*

3. Winter Sports. (Laboratory Fee.) One credit. Winter, Sec. 1, T. Th. 12; Sec. 2, T. Th. 1; Sec. 3, T. Th. 2; Sec. 4, T. Th. 3. *Vanderhoff*

9. Elementary Fencing. One credit. Fall, Sec. 1, M. W. F. 11; Sec. 2, T. Th. 11. Winter, Sec. 1, M. W. F. 10; Sec. 2, T. Th. 11. Spring, Sec. 1, M. W. F. 3. *Staff*

60. Archery. One credit each quarter Sec. 1, Fall, M. W. F. 9; Winter, M. W. F. 9; Spring, M. W. F. 9. *S. Nelson*

63. Recreative Games. One credit each quarter. Fall and Winter. T. Th. 10. *Staff*

66. Badminton. One credit. Fall, Winter, Spring, Sec. 1, T. Th. 8; Sec. 2, T. Th. 9. *Staff*

67. Elementary Tennis. One credit. Spring, Sec. 1, M. W. F. 8; Sec. 2, T. Th. 8; Sec. 3, T. Th. 9; Sec. 4, M. W. F. 10; Sec. 5, M. W. F. 11; Sec. 6, T. Th. 11; Sec. 7, M. W. F. 3. *Staff*

68. Elementary Folk Dance. One credit. Fall, T. Th. 9; Winter, M. W. F. 8. *Staff*

69. Intermediate Folk Dance. Prerequisite: P.E. 68 and satisfactory completion of minimum service course requirements. One credit. Winter, T. Th. 8. *Staff*

70. Elementary Tap Dancing. One credit. Fall, Winter, M. W. F. 3; Spring, M. W. F. 2. *Nelson*

71. Intermediate Tap Dancing. Prerequisite: P.E. 70 and satisfactory completion of minimum service course requirements. One credit. Winter, T. Th. 3. *Nelson*

72. Social Dancing. One credit. Fall, Winter, T. Th. 10. *Heaton*

73. Golf. One credit. Spring, Sec. 1, M. W. F. 11; Sec. 2, T. Th. 2. *Staff*

74. Life Saving. Prerequisite: Ability to swim and permission of the instructor. Proper American Red Cross certification is given those students who pass the examination. One credit. Winter, M. W. F. 3. *Vanderhoff*

109. Advanced Fencing. Prerequisite: P.E. 9 and 10, and satisfactory completion of minimum service course requirements. One credit. Fall, T. Th. 3. *Staff*

136. Advanced Golf. One credit. Spring, T. Th. 3. *Staff*

155. Diving. Prerequisite: Swimming. One credit. Spring, M. W. F. 2. *Staff*

161. Advanced Archery. Prerequisite: 60. Fall, M. W. F. 8. Winter, M. W. F. 8. *Staff*

166. Advanced Badminton. Prerequisite: P.E. 66, 36 or 57, plus satisfactory completion of minimum service course requirements. One credit. Fall, T. Th. 3. Winter, T. Th. 3. Spring, T. Th. 3. *Staff*

167. Advanced Tennis. Prerequisite: P.E. 67, and satisfactory completion of minimum service course requirements. One credit. Spring, M. W. F. 2. *Staff*

168. Square Dancing. One credit. Fall, Winter and Spring, T. Th. 1. *Staff*

174. Water Safety Instructor's Course. Prerequisite: An American Red Cross Senior Life Saving certificate and permission of the instructor. Special attention is given methods of teaching swimming, diving, life saving, and the use of small water crafts. Proper American Red Cross certification is given those students who pass the examination. Two credits. Spring, M. W. F. 2. *Vanderhoff*

THEORY AND PROFESSIONAL COURSES

Sp. 20. Playground Dramatics and Pageantry. See Speech 20.

20, 21, 22. Fundamental of Sports. A freshman laboratory course for Men Physical Education Majors. These courses are prerequisites for Physical Education 120, 121, 122. One credit each quarter. T. Th. 2. (Not taught 1947-48.) *Heaton*

30, 31, 32. Fundamentals of Sports. A sophomore laboratory course for Men Physical Education majors. These courses are prerequisites for Physical Education 130, 131, 132, and are a continuation of the Freshman class. One credit each quarter. Fall, Winter and Spring, T. Th. 2, and T. Th. 9. *Heaton*

43. Recreational Crafts. See Industrial Arts 43.

†**55. First Aid.** The standard American National Red Cross Course in first aid with emphasis upon the practical use of the knowledge as applied to every day life in various occupations. Detailed demonstrations and practice. The American Red Cross First Aid Certificate may be obtained by students in the course who pass a satisfactory examination. Three credits. Fall, M. W. F. 10. *Staff*

†Does not satisfy Biological group requirement.

75. Introduction to Physical Education. A survey of the whole field of physical education, showing its relationship to art and enriched living. Two credits. Fall, T. Th. 8. *Heaton*

80. Nature and Function of Play. An analysis of the basic principles underlying play; the function of play in the growth, development, and social adjustment of the child and the adult. Two credits. Winter, T. Th. 8. *Heaton*

81. Rhythms and Dramatic Games. For women. A study of music for young children and its use in creative movement. Methods of presenting and developing rhythms will be studied. Two credits. Fall, M. W. F. 8. *Dutton*

83. Playground and Community Recreation Leadership. For men and women. Consists of lectures and practical work. Lectures will consider selection of suitable material, and methods of handling various groups. Four credits. Spring, Daily 10. *Heaton*

84. Normal Growth and Development. A study of the laws of normal growth and development of the child differences. Special emphasis on the age characteristics with sex and individual differences. Three credits. Spring, M. W. F. 9. *Dutton*

85. Methods in Intramural Organization for Men. Desgined to study the organization of intramural athletics. Three credits. Fall, M. W. F. 11. *Hunsaker*

86 and 87. Sports Officiating. The knowledge of rules, mechanics of officiating, proper instructions to other game officials such as timers and scores, and game administration. Two credits. Fall and Winter, Daily 12. *Vanderhoff and Heaton*

92. Organization of Intramural Programs for Women. To study the organization of sports days, play days, tournaments and the administration of intramural activities for women. Two credits. Winter, T. Th. 10. *S. Nelson*

94, 95, 96. Physical Education Laboratory. For teaching team sports fundamentals to freshman and sophomore women majoring or minoring in physical education. One credit. Fall, M. W. F. 11. Winter, M. W. F. 1. Spring, M. W. F. 11. *S. Nelson*

97, 98, 99. Physical Education Laboratory. Designed for teaching individual sport and dance fundamentals to freshman and sophomore women majoring or minoring in physical education. One credit. Fall and Winter, M. W. F. 1. Spring, M. W. F. 11. (Not taught in 1947-48.) *S. Nelson*

104. Kinesiology. Articulations and muscles with emphasis on movements and actions. The skeleton, manikin, and man himself will afford the laboratory material. Three credits. Fall, M. W. F. 10. *Hall*

106. Physiology of Activity. Changes in important organ systems in relation to muscular activity are treated in this course. Four credits. Prerequisite: Physiology 4. Winter, M. T. W. Th. 1. *Hall*

120, 121, 122. Technique of Team Sports. For men students majoring in Physical Education. P.E. classes 20, 21, 22 are prerequisites for this class. Students will be taught techniques of dual combatives and team sports. Each student will be expected to prepare a teaching syllabus of class work. Two credits each quarter. M. W. F. 9. (Not taught in 1947-48.) *Heaton*

130, 131, 132. Technique of Individual Sports. For men students majoring in Physical Education. Prerequisites: Physical Education 30, 31, 32. Students will be taught the technique of individual, gymnastics, and acquatic sports. Each student will be expected to prepare a teaching syllabus for the class work. Two credits each quarter. Fall, Winter and Spring, M. W. F. 2. *Heaton*

141. Advanced Modern Dance. A further development of skills in the use of tools of movement, rhythm and music improvisation and dance composition; present trends in the dance in education. Two credits. Spring, M. W. F. 10. *Whitney*

150. Methods in Dance. A course designed for students who are planning to teach Dancing, Tap, Folk, Modern or Social Dancing. A syllabus will be required of each student. Four credits. Spring, M. T. W. Th. 1. *Whitney*

153. Leadership in Dance. An advanced class in dance leadership designed to meet the needs of those students who expect to teach social or square dancing in schools or churches. One quarter of social or square dancing must be taken as a prerequisite. Special emphasis is given methods of teaching group

dancing and in creating original routines. A syllabus is required. Two credits. Spring, M. W. F. 9. *Heaton*

160, 161, 162. Techniques of Team Sports for Women. Upper division students majoring or minoring in physical education are taught the techniques of teaching and officiating the following team sports: Fall, soccer, speedball and fieldball; Winter: basketball and volleyball; and Spring: field hockey and softball. Two credits each quarter. Fall, M. W. F. 10; Winter, M. W. F. 2; and Spring, M. W. F. 8. *Dutton*

163, 164, 165. Techniques of Individual Sports for Women. Upper division students majoring or minoring in physical education are taught the techniques of teaching and officiating the following individual sports: Fall: swimming, diving and tumbling; Winter: archery, badminton and fencing; and Spring: golf, tennis and track and field. Two credits each quarter. Fall, M. W. F. 2; Winter, M. W. F. 2; and Spring, M. W. F. 8. (Not taught in 1947-48.) *Dutton*

177. Elementary School Physical Education. A survey of the activities, program aids, equipment, facilities and leadership needed to carry on an adequate program of physical education in the elementary school. Three credits. Winter, M. W. F. 10. *Dutton*

179. Camping and Camp Craft. Designed to give training in camp technique and camp leadership. Different types of camps and their organization, supervision, equipment, and safety will be considered. Several short hikes and an overnight camp will be conducted during the course. Each member registering for the course will be expected to participate in these hikes. Two credits. Fall, M. W. 11. Spring, M. W. F. 11. *Hall*

180. Corrective Physical Education. (Women.) A study of those facts in body mechanics which contribute to the basic principle of posture. Analysis of postural deviations, their prevention and correction. Prerequisites: Physiology 104, 106 and 4. Three credits. Spring, M. W. F. 9. *Dutton*

181. Corrective Physical Education. (Men) An analysis of the techniques or mechanics of the movements in the classified groups of physical education activities; an analysis of the teaching explanations of how to make movements or coordinations; an analysis of skills; a study of the nomenclatures used in the formulation of a working nomenclature for all the activities. Three credits. Spring, M. W. F. 11. *Staff*

182. Materials and Methods in Physical Education for Elementary Schools. For men and women. A study of the activity interests of children and appropriate materials for different age levels, selection of materials and methods of presentation. Four credits. Spring, Daily 10. *Dutton*

183. Interpretation of Physical Education Objectives. An analysis of the results and values of physical education activities under leadership in terms of development, adjustment and standards and their relationships as objectives. Five credits. Fall, Daily 9. *Hunsaker*

184. Administration of Physical Education. A study of the administrative procedures in the conduct of physical education in the high school; curriculum construction and program planning. Three credits. Prerequisite: P.E. 92 (for women), P.E. 85 (for men). Spring, M. W. F. 9. *Hunsaker*

185. History of Physical Education. Two credits. Winter, T. Th. 9. *Hall*

186. Heavy Apparatus. A study of methods of teaching gymnastics such as the horizontal bar, parallel bars, side horse, and rings. Prerequisite, at least one quarter of Elementary Heavy Apparatus. Two credits. Fall and Winter M. W. F. 11. *Heaton*

188. Methods in Football. Fundamentals of football, theory and practice, details of such position on the team, training, and managing, complete technique of developing offensive and defensive tactics. A comparison of the various systems in American Intercollegiate football. Two credits. Fall, M. T. W. 12. *Romney*

189. Methods in Basketball. Coaching and training of basketball teams, beginning with fundamentals; passing, dribbling, and pivoting, with emphasis on the psychology of the game; various methods of defense and offense. Two credits. Winter, M. T. W. 12. *Whitesides*

190. Methods in Track and Field. How to train for various track and field events; their form and technique; conduct of the athletic meets; construction, use, assembling of all equipment used by the participants on the field; development of certain types of individuals for certain events. Two credits. Spring, M. W. F. 1. *Linford*

191. Interpretation of the Health Examination. Examination procedures, the detection of physical defects, the general assessment of the health of the individual, and the follow-up program. Three credits. Spring, M. W. F. 11.

871 (R). When an engine used in freight service has steam hose on r *Preston*

192. Tests in Physical Education. Practical studies of tests now in use, and the technique of test construction. Three credits. Winter, M. W. F. 11. *Hunsaker*

195, 295. Problems in Physical Education. Three credits. Arranged. Fall, Winter, Spring. *Hunsaker*

196. Organization of Recreation. For men and women. General problems of organization and administration of community recreation departments, including staff, facilities, program of activities, and office management. Special problems of recreation surveys, legislation, property acquisition, finances, construction, and maintenance, and securing community and school cooperation in a united recreation program. Three credits. Winter, M. W. F. 9. *Heaton*

199. Physical Education Seminar. Three credits. Fall, Winter, Spring, M. W. F. 1. *Hunsaker*

250. Reading and Conference. For men and women. Provides for individually directed study. *Hunsaker*

271. Research and Thesis Writing. Time and credit arranged. *Hunsaker*

Psychology

ARDEN FRANDSEN, *Professor;* DAVID R. STONE, HEBER C. SHARP, *Asisstant Professors;* ELDON JACOBSEN, *Veterans' Adviser.*

Courses in the Department of Psychology contribute to the professional training and personal development of students in nearly every department.

A testing and counseling service is also available to all students who would like help in making educational and vocational choices, and in problems of personal adjustment. Inquire at Room 175, Main building.

A major in psychology should prepare students for diagnostic and remedial teaching and for dealing with personality and conduct problems of children in the elementary school; for psychology counseling in high schools; for teaching psychology, study habits, mental health, and personality development in high school; for personnel work in industry, the U. S. Employment Offices, the Civil Service, etc.; and for graduate study in psychology, education, child development, and social work. It is also a suitable major for students planning to study medicine, nursing, or law after graduating from college.

Requirements for a major in psychology include 40 credits of approved courses from the following: Psychology 3, 54, 75, 102a and 102b, 103a and 103b, 107, 110, 112, 120, 140, 145, 175, 205a, b, c, 206; Mathematics 111; Physiology 5; Sociology 170; Education 107, 110 and 211; and Speech 171.

A minor in psychology (including Psychology 3, 102a, 102b, 103a, 103b, and 75 or 107 or 120 or 140) recommended for any high school teacher who expects to participate in the school guidance and counseling program and for social workers who do not take an undergraduate major in psychology.

Minor: Eighteen credits of approved courses from those listed above.

Master of Science Degree in Psychology. This degree meets the training requirements for the First Class School Counselor's Certificate issued by the State Board of Education, it prepares the student for more advanced positions in clinical psychology in government services and in other social agencies, or for work in industry. Programs of study for this degree consist of courses numbered between 100 and over 200, and are planned in consultation with the major professor and an advisory committee. Thirty hours of approved courses in psychology or closely related fields are a prerequisite.

3. Elementary General Psychology. A study of the general principles of human behavior including: nature of personality; factors determining develop-

ment; how we learn, observe, and think; motives of human conduct; dealing with people; and the maintenance of personal efficiency and mental health. Intended for Lower Division students in all schools of the College. Five credits. Fall, Daily 8, 9, 2. Winter, Daily 8, 9, 2. Spring, Daily 9, 10, 2. *Stone and Sharp*

13. Study Habits. A practical course intended to aid students in improving the efficiency of their work and study habits. Two credits. Fall, M. W. F. 11. Winter, M. W. F. 11; Spring M. W. F. 11. *Stone*

30. Psychology for Nurses. Three credits. Time arranged. *Staff*

54 or 154. Psychology of Business and Industry. The methods and explanatory principles of psychology will be applied to understanding several general problems of business and industry, including vocational choice and the selection of employees; advertising and selling; marketing and consumer research; conditions for efficient work; and the psychological aspects of training for work in business and industry. (See also Bus. Adm. 54.) Prerequisite: General Psychology or instructor's approval. Three credits. Winter, M. W. F. 2. *Staff*

75. Experimental Methods in Psychology and Education. A study of the scientific method and of specific experimental procedures applied in the study of fundamental problems in psychology and education. Prerequisite: General Psychology. Three credits. Fall, M. W. F. 2. *Sharp*

102a. Educational Psychology. A professional course for prospective high school teachers intended to increase understanding of personality and to develop greater insight into the conditions for effective learning. Applications to development in adolescence of both normal and deviate personalities, to provisions for individual differences, and to learning junior and senior high school subjects will be emphasized. Prerequisites: General Psychology. Five credits. Fall, Daily 10. Spring, Daily 10. *Staff*

102b. Applications of Statistics to Education and Psychology. An elementary study of the statistical procedures used in handling test scores in the schools and of the concepts needed to read current educational and psychological literature. Two credits. Fall, T. Th. 9. Spring, T. Th. 8. *Staff*

103a or 203a. Clinical Psychology: Psychometrics applied to guidance, adjustment problems, and remedial teaching. A course for school counselors, personnel workers, social workers, and clinical psychologists, which considers the selection, evaluation, administration, interpretation, and practical uses of tests of intelligence, aptitudes, interests, personality and quality of personal and social adjustment. Prerequisites: General Psychology and Elementary Statistics. Five credits. Fall, Daily 8. *Staff*

103b or 203b. Clinical Psychology: Directed practice in the administration of individual tests. The main emphasis in the course is on acquiring skill in diagnosing intelligence by the individual Binet procedure; but the writing of clinical reports and recommendations and the uses of other individual tests of aptitudes, personality, and adjustment is also studied. Prerequisite: Clinical Psychology or its equivalent. Three credits. Winter, M. W. F. 11. *Staff*

103c or 203c. Clinical Psychology: Theory and practice of counseling and phychotherapy. In educational and vocational guidance, in improving school achievement and worker efficiency, and in treating problems of personal and social maladjustments, the uses of the following procedures will be studied: non-directive counseling; directed problem-solving interviewing; giving advice, assurance, persuasion, and information; and of controlled family, school, club or camp, community, and institutional environments. Prerequisite: General Psychology. Three credits. Spring, M. W. F. 8. *Stone*

107. Psychology of Learning. A comprehensive study of descriptions of learning, factors related to efficiency, explanatory theories of learning, and of applications of the facts and explanatory principles to guiding learning in school and out-of-school situations. Prerequisites: General Psychology and Elementary Statistics. Three credits. Winter, M. W. F. 9. *Sharp*

110. Child Psychology. A study of the roles of maturation, learning, and environmental conditions in the motor, mental, social, and emotional development of children from birth to adolescence. Generalizations with respect to individual differences, emotions, motivation, how children learn, observe, and think will be applied to understanding and guiding children's behavior in home,

school, and community. Opportunity for observation and applications of psychological methods of child study in the school will be provided. Prerequisite: General Psychology. Three credits. Fall, M. W. F. 2; Spring, M. W. F. 8. *Staff*

112. Educational Psychology of the Elementary School Curriculum. A study from the point of view of psychological theory and research, of the aims, selection and sequence of content, methods of teaching, provisions for individual differences, and measurement of outcomes in the elementary school curriculum. The tool subjects will be emphasized. Prerequisite: General Psychology. Three credits. Winter, M. W. F. 1. *Staff*

120. Social Psychology. A study of the adjustment of the individual to his environment, including consideration of learning of social habits, social motivation, language, attitudes, and group behavior. These concepts will be applied in understanding such topics as propaganda, institutional behavior, group prejudices, morale, and leadership. Prerequisite: General Psychology. Three credits. Spring, M. W. F. 9. *Stone*

130 or 230. Psychology of Exceptional Chlidren. The development and behavior characteristics of exceptional children and of the education, home management, social control, and psychological treatment especially suited to their needs. The groups included are the mentally deficient, the gifted, children with special achievement disabilities, speech defectives, the crippled and physically handicapped, and children with serious personality and conduct problems. Three credits. Winter, T. 10; Th. 10, 11. *Staff*

140. Abnormal Psychology. A descriptive and explanatory study of the varieties of mental abnormality—psychoses, psychoneuroses, and minor maladjustments—their causes, the methods of treatment, and the mental hygiene approach in preventing psychological maladjustments. Prerequisite: General Psychology. Three credits. Spring, M. W. F. 2. *Sharp*

145. Mental Hygiene. The common personal and social adjustment problems of normal people. It shows how people, in striving to attain a balanced satisfaction of motives in their major live activities, learn different modes of adjustment: effective patterns of behavior, a variety of maladjustive mechanisms, and non-adjustive reactions. It should aid in cultivating personal efficiency and mental health and increase understanding of the human problems dealt with by parents, teachers, social workers, and personnel workers. Prerequisite: General Psychology. Three credits. Winter, M. W. F. 10. *Staff*

175. Physiological Psychology. A study of the physiological mechanisms underlying typical normal and abnormal behavior. Prerequisite: General Psychology. Three credits. Spring, M. W. F. 2. *Sharp*

200. Advanced Educational Psychology. The contributions of modern theory and recent research to the following fundamental problems of teaching and guidance will be studied: motivation; learning; improvement of study habits; uses of tests in guidance and in measurement of achievement; social psychology of childhood and adolescence; personality and conduct problems; and mental health. Problems for masters degree thesis will be indicated. Prerequisite: Educational Psychology. Five credits. Fall, Daily 1. *Staff*

203d. Practicum in Psychological Testing. Students will be assigned a testing schedule in the psychological clinic where they will administer, score and evaluate tests, and participate in interpretive sessions. Fall, Winter, Spring. Time and credit arranged. *Staff*

205a, b, c. Readings on Current and Special Topics in Psychology. Weekly discussions of topics in current magazines plus independent reading either of some especially significant book or of periodical literature on some specialized topic, selected according to each student's interest. Two credits each quarter. (May be taken 1, 2 or 3 quarters.) Fall, Winter and Spring, Th. 4. *Staff*

206. Research on Special Problems in Psychology. Credit and time arranged. *Staff*

250. Projective Methods for the Study of Personality. A study of the dynamics of human adjustment and of the common projection methods for revealing motives, attitudes, and adjustment mechanisms in individual personalities. Three credits. Arranged. *Staff*

SCHOOL OF ENGINEERING, AND TECHNOLOGY

J. E. CHRISTIANSEN, *Dean;* E. C. JEPPSEN, *Chairman, Division of Technology*

General Information

Organization: The School of Engineering and Technology consists of two major divisions:

The Division of Engineering which includes the departments of:
- Agricultural Engineering
- Civil Engineering
- Irrigation and Drainage

The Division of Technology which includes the departments of:
- Aeronautics
- Air Conditioning and Refrigeration
- Automotive
- Industrial Education
- Metalwork and Mechanical Drawing
- Radio
- Woodwork and Building Construction

The Civil and Agricultural Engineering curricula were established in 1888 when the College was founded. Automotive, Metals, and Woodwork and Building Construction were also established in 1888, but under the name of Mechanic Arts. Degree work in Radio was established in 1929. Degree work in Aeronautics was established in 1940, and in Air Conditioning and Refrigeration, and Welding in 1947. The four-year curricula lead to the degree of Bachelor of Science, with mention of the specific curriculum taken. The name of the School was changed from the School of Engineering, Industries and Trades to its present name in 1947.

Division of Engineering: The Division of Engineering offers both undergraduate and graduate work leading to Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering. Both of these curricula include courses and majors in Irrigation and Drainage.

The Agricultural Engineering curricula include the common engineering courses of the Freshman, Sophomore, and Junior years. They differ from the Civil Engineering curricula with respect to certain courses in the Junior year, and permit of greater specialization in the Senior year. Students receive instruction in general engineering and agriculture, and may select as a major, Farm Machinery, Farm Structures, or Irrigation and Drainage. Graduates of these curricula are well trained in general engineering and can easily complete all requirements for a degree in Civil Engineering in one additional year.

The Civil Engineering curricula permit the student to choose a major from Highways, Irrigation and Drainage, Structural Design, or Sanitary Engineering. Students not wishing to specialize may, with permission of the Dean, select optional courses from two or more fields and major in General Engineering. Students taking advanced Military are not required to take the optional courses. The curricula in Civil Engineering are fully accredited by the Engineers' Council for Professional Development.

Division of Technology: The Division of Technology offers four-year curricula leading to the Bachelor of Science degree in Aeronautics, Air Conditioning and Refrigeration, Automotive, Metals and Machine Practice, Radio, Welding, and Woodwork and Building Construction. Undergraduate and graduate work are offered in the field of Industrial Education. These degree curricula are designed to train skilled technicians, supervisors, managers, plant operators, shop and garage foremen, and teachers of Industrial Arts, and Trades and Industries. They combine a training in vocational skills, applied science, and general education.

Technical short courses are offered in Aircraft and Engine Mechanics, Air Conditioning and Refrigeration, Automotive Repair, Auto Body Reconditioning, Carpentry, Diesel Repair, Machine Shop Practice, Commercial Photography, Radio Service and Repair, and Welding. These short courses are designed to meet the needs of those who do not desire a degree, but who wish to learn a skilled trade, and at the same time have an opportunity to benefit from general college courses and to enjoy college life.

Admission: For general requirements see the Academic Regulations in the catalog introduction. For entrance in the Division of Engineering, students must have taken in high school, Algebra (b) and Solid Geometry, or the equivalent, or must complete without credit toward graduation Math. 33 and 34. These should be taken concurrently during the Fall Quarter of the Freshman year.

All students over 18 years of age are eligible for the technical short-course curricula.

Scholarship: All students must maintain an average grade of C or better to remain in College and be eligible for graduation. The faculty reserves the right to accept toward graduation only those credits with a grade of C or better. In the Division of Engineering, it is very important that students make a C grade, or better, in all courses in Mathematics taken during the Freshman and Sophomore years. Students who fail to do this usually have difficulty with upper division engineering courses.

Graduation: Candidates for graduation must satisfy the general college requirements as listed in the Academic Regulations, with the exception of those pertaining to group requirements. They must, in addition, satisfy the requirements of the prescribed curriculum of their elected major.

Opportunity for Graduates: The tremendous modern development of industry, the necessity for control and development of natural resources, the rapid advance of transportation and communication, and the development of structures to meet the needs of society, give assurance that future graduates of the School of Engineering and Technology will have ample opportunity for professional employment of an interesting and remunerative character.

Faculty Advisors: Personal contact with the student is provided through a system of advisors who assist the student when registering, and who are available for consultation at all times.

Personnel Service: The School of Engineering and Technology, through its faculty, establishes definite contacts with those industries, corporations, municipal, state, and federal agencies that employ technically trained men. Employment assistance is given to members of each graduating class, to alumni who desire to change positions, and to undergraduates who wish summer employment.

Division of Engineering

The Division of Engineering offers both undergraduate and graduate work leading to the Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering. The courses offered by the department of Irrigation and Drainage, constitute an important part of both curricula, and a major option for those wishing to specialize in this field. Many of the leaders in the field of irrigation and drainage are graduates of Utah State Agricultural College.

Objectives: The objectives of the four-year curricula in Engineering are to provide the student an opportunity to secure the thorough, fundamental, and technical education which is necessary for professional work of the highest grade, and to insure the development of those physical, mental, moral, and social qualities which are essential to high professional attainment.

Upper Division Standing: A student must have completed a total of 96 credits, including Chemistry 10 and 11, Physics 20, 21, 22, and Mathematics 99, or its equivalent, before he is admitted to upper division standing in engineering, and is eligible to take C.E. 101 and C.E. 141.

Engineering Societies: General professional association and advancement are promoted by the activities of the student branches of the national engineering societies, of which the following are represented, either by facutly membership or student chapters, or both: American Society of Civil Engineers, American Society of Agricultural Engineers, American Road Builders' Association, Highway Research Board, American Concrete Institute, American Society for Engineering Education, and American Geophysical Union.

Summer Surveying Camp: During the summer session following the Sophomore year, a surveying camp is held where plane, topographical, and route surveying are taught. Completion of Summer Surveying Camp is required of all engineering students.

Engineering Seminars: Engineering seminars are a feature of the advanced engineering work. Courses 198 and 199 are required of all engineering students during the Senior year.

Field Trips: Field trips to local construction projects, engineering works, and industries are arranged for engineering students. All seniors in engineering are required to take a supervised field trip covering the major engineering works in the western United States. This trip is usually scheduled during the Spring Quarter.

COMMON COURSES

All candidates for a degree in Engineering must complete satisfactorily the following courses common to all engineering curricula:

Freshman

Course	F	W	S
C.E. 61, 62, 63	2	2	3
Chem. 10, 11, (12)*	5	5	(5)
I.D. 12†	—	—	4
English 17, 18, 19	3	3	3
Math.‡ 35, 46, 97	5	5	5
Shop§	2	2	2
M.S. 1, 2, 3	1	1	1
	18	18	18(19)

Sophomore

Course	F	W	S
C.E. 84, 82, 85, 87**	3	3	3
Math. 98, 99, 122	5	5	3
Physics 20, 21, 22	5	5	5
Geology 3	—	—	5
Economics 51	—	5	—
Speech 5	3	—	—
C.E. 65	1	or	(1)
M.S. 4, 5, 6	1	1	1
	18	19	17(18)

Agricultural Engineering

J. E. CHRISTIANSEN, O. W. ISRAELSEN, C. H. MILLIGAN, *Professors;* JOSEPH COULAM, *Associate Professor;* SPENCER H. DAINES, B. L. EMBRY, A. ALVIN BISHOP, *Assistant Professors;* FRANK OLSEN, *Instructor.*

For nearly a century in America, those agricultural problems that have demanded the help of engineers have been solved by civil, mechanical, and electrical engineers. During the last quarter century, the need and value of engineering services in agriculture have grown so rapidly and widely as to demand the development of a major field of engineering designated as Agricultural Engineering.

The Department of Agricultural Engineering offers instruction in courses involving the application of engineering knowledge to the solution of farm problems. The most important of these problems are in the fields of farm machinery, farm motors, rural electrification, farm buildings, farm sanitary equipment, soil erosion control, irrigation, and drainage.

A four-year curriculum leading to a Bachelor of Science Degree in Agricultural Engineering is offered. This curriculum includes mathematics, arts and sciences, fundamental subjects in the different engineering departments, agricultural courses selected to familiarize the student with modern agriculture, and a thorough treatment of the Agricultural Engineering courses.

*Chem. 12 required of Sanitary Engineering Majors.

†I.D. 12 not required of Sanitary Engineering Majors.

‡Students deficient in high school Mathematics, Algebra (b) and Solid Geometry, must register for Math. 34 and Math. 33 during the Freshman year. Math. 33 and 34 do not count credit toward graduation in Engineering.

§Shop includes Metalwork, Woodwork, and Welding. All three courses are offered each quarter.

**C.E. 87 is to be taken following Sophomore year in Summer Session. Seven credits.

Graduates from this curriculum have opportunity to work in the following fields: (a) The manufacture and development of farm machinery and equipment; (b) irrigation, drainage, and soil conservation; (c) rural electrification; (d) design and construction of farm buildings; (e) teaching, research, and extension in colleges, experiment stations, and in the United States Department of Agriculture; (f) agricultural engineering for farm papers and technical magazines; (g) selling and maintenance of farm equipment; and (h) management of large farms.

Students majoring in Agricultural Engineering should be well versed in farm practices and have a real interest in the agricultural industry.

The Agricultural Engineering Department has available for its use approximately 6,500 square feet of laboratory space. The farm power and machinery laboratory is equipped to service, overhaul, and maintain farm machinery. The facilities of the irrigation and drainage laboratories are ample to conduct both research and class exercises in all their various divisions. These laboratories are housed in the Engineering and Agricultural Engineering Buildings.

AGRICULTURAL ENGINEERING CURRICULA

Degree: Bachelor of Science in Agricultural Engineering.

Freshmen and Sophomore years—See Common Courses.

Junior

Course	F	W	S
C.E. 101, 102, 103	4	4	4
C.E. 141, 142	4	4	—
A.E. 110	—	—	2
C.E. 197, 196, 143	4	4	4
B.A. 100	3	—	—
C.E. 192	—	3	—
Agron. 56	—	—	4
Pol. Sci. 20a, 20b	3*	3*	—
A.H. 1	—	—	3*
	18	18	17

Senior

Course	F	W	S
A.E. 111, 115	3	4	—
C.E. 108, 109, 110	1	1	1
I.D. 149, 160, 145	3	3	3
C.E. 105	6	—	—
Ag. Econ. 106	—	—	5
A.E. 109, 108	—	4	4
A.E. 198, 199	—	2	2
English 111	4	—	—
Options*	—	3–6*	3–5*
	17	17–20	18–20

Senior Options

Major	Course	F	W	S
Farm Machinery	A.E. 116, 117	—	5	5
Irrigation and Drainage	I.D. 146, 147	—	3	3
Farm Structures	C.E. 106, A.E. 106	—	6	5

COURSES

4. Dairy Mechanics. A study of the basic equipment found in modern dairy plants; their accessories and upkeep. Four credits. Fall, M. W. F. 10; M. 2-5. *Daines*

13. Farm Machinery Repair. Applied problems in farm machinery repair and maintenance. Prerequisite: Forging 81a, and Welding 96, or equivalent. Two credits. Spring, T. Th. 2-5. *Olsen*

14a. Farm Motors for Agricultural Students. The principles, operation, care, and maintenance of internal combustion engines and electric motors. Three credits. Fall and Spring, T. Th. 10; Lab., T. or Th. 2-5. *Daines*

15a. Farm Machinery for Agricultural Students. Principles of mechanics and materials as applied to farm machinery. The operation, adjustment, and care of the various types of agricultural machines. Three credits. Fall and Spring, M. W. 10; Lab., M. or T. 2-5. *Embry*

*Not required of students taking Advanced Military 101-106.

105. Farm Woodwork and Building for Agricultural Students. Location, planning, and construction of farm buildings. Wood and metal preservatives, fences, and fencing, and the farm workshop. Five credits. Fall, M. W. F. 8; Lab., T. Th. 2-5. *Coulam*

106. Farm Structures. Economics of farm buildings; insulation as it involves heating and ventilating; mechanics of farm buildings; types of construction; building materials; location and planning of the farmstead; fundamental requirements and design of farm buildings common to western agriculture. Prerequisite: C.E. 105; Five credits. Spring, M. W. F. 10; Lab., T. Th. 2-5. *Coulam*

108. Engineering Aspects of Soil and Water Conservation. Extent and kinds of erosion; rate of water absorption, soil erodibility, soil vegetation and cultural practices. Erosion control structures, surveys for and hydraulic design of terraces, terrace outlets and soil saving dams. Tillage and farming methods, strip-cropping, erosion and alkali problems on irrigated land. Four credits. Spring, M. W. F. 11; Lab., F. 2-5. *Bishop*

109. Farm Utilities. Modern methods of heating, lighting, ventilating, water supply, and farm sanitation; and farm electrical appliances. Four credits. Winter, M. W. F. 11; Lab., F. 2-5. *Daines*

110. Pumps and Pumping. Selection and installation of pumping equipment, theory of pumps, power schedules and cost of pumping. Prerequisite: C.E. 142. Two credits. Spring, T. Th. 9. *Milligan*

111. Mechanisms in Farm Machinery. A study of mechanical methods of transmitting motion of farm machines, including cams, gears, universal joints, etc. Prerequisite: C.E. 103. Three credits. Fall, T. Th. 8; Lab., W. 2-5. *Daines*

115. Farm Implements. Selection, operation, adjustment and care of the various types of agricultural machines. Prerequisite: A.E. 111. Four credits. Winter, M. W. F. 8; Lab., W. 2-5. *Embry*

116. Farm Tractors. A study of design, operation, and performance of the farm tractor. Efficiencies and ratings as determined by the Nebraska Tractor Tests. Tractor troubles and overhauling. Five credits. Winter, M. W. F. 10; Lab., T. Th. 2-5. *Daines*

117. Farm Machinery Design. Fundamentals of farm machinery design including draft requirements of farm implements. Selection of metals, stress analysis, layout and construction of farm machines. Prerequisite: A.E. 111. Five credits. Spring, M. W. F. 10; Lab., T. Th. 2-5. *Daines*

198, 199. Engineering Seminar and Conferences. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all seniors. Two credits each quarter. Winter and Spring, T. Th. 10. *Christiansen*

230. Special Problems in Agricultural Engineering. Independent study of chosen problems in agricultural engineering, given under the direction of a member of the department staff. The student is expected to develop his own initiative in pursuing these problems. Standard formal typewritten reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Time and credit arranged. *Staff*

Civil Engineering

J. E. CHRISTIANSEN, O. W. ISRAELSEN, H. R. KEPNER, C. H. MILLIGAN, *Professors;* DEAN F. PETERSON, JR., E. M. STOCK, *Associate Professors;* A. ALVIN BISHOP, SPENCER H. DAINES, B. L. EMBRY, WILLIS A. TINGEY, ..., *Assistant Professors;* REYNOLD K. WATKINS, ..., *Instructors.*

Civil Engineering consists of the economic application of the laws, forces, and materials of nature to the design and construction of engineering structures, including irrigation and drainage systems, highways, railways, bridges, buildings, dams, water supply systems, hydro-electric plants, and many other works which are a part of the requirements of civilization today.

The curriculum in Civil Engineering has been carefully planned, and is accredited by the Engineers' Council for Professional Development. It is based upon a thorough training in English, mathematics, physics and chemistry, combined with drawing, surveying, mechanics, hydraulics, and economics. Upon this substructure is built a superstructure consisting of the applications of these subjects to the many phases of Civil Engineering. Special emphasis is placed upon work in Irrigation and Drainage.

A Summer Surveying Camp is required, and academic work is supplemented by local field trips during the Junior year, and a major field trip of approximately one week duration, during the Senior year. These field trips provide opportunity for first hand study of projects under investigation, construction and after completion. All field trips are carefully planned and are carried out under the joint direction of the faculty and representatives of the work being inspected.

An analysis of the status of the Civil Engineering graduates from Utah State Agricultural College shows that approximately 80 percent are in federal, state, city, or county positions, and about 20 percent in private practice, or working for private corporations. Finding employment for graduates has never been a problem at this institution.

The Engineering departments are housed in the Engineering Building, where well equipped laboratories and classrooms provide ample facilities for the work in engineering. The irrigation and hydraulics laboratories are equipped with pumps, turbines, water measuring devices, pipe lines, and models of hydraulic structures. A model hydraulic laboratory demonstration unit is available for instruction and laboratory use. The soil mechanics laboratory is equipped with the latest machines and instruments for determining the engineering properties of soil. The laboratories are equipped for testing both metallic and non-metallic materials. Standard testing equipment for determining the physical properties of timber, metals, clay products, concrete and bituminous materials are available. The structural laboratories are equipped for demonstration and investigation of statically indeterminate structures, using Begg's method and the Photo-elastic Polariscope.

CIVIL ENGINEERING CURRICULA

Degree: Bachelor of Science in Civil Engineering.

Freshman and Sophomore courses—See Common Course, page 182.

Junior

Course	F	W	S
C.E. 101, 102, 103	4	4	4
C.E. 141, 142, 148	4	4	4
C.E. 197, 196, 143	4	4	4
C.E. 192, 120	—	3	3
B.A. 100	3	—	—
Pol. Sci. 20a, 20b	3†	3†	—
Geol. 103 or C.E. 181	—	—	3†
	18	18	18

Senior

Course	F	W	S
C.E. 105, 106, 107*	6	6	5*
C.E. 108, 109, 110	1	1	1
C.E. 150, 190	4	3	—
I.D. 146*, 145*	—	3*	3*
C.E. 198, 199	—	2	2
English 111‡	4	or	(4)
Options †	3†	3†	3†
	18	18	14(18)

Senior Options§

Major	Course	F	W	S
Highways	C.E. 124, 125, 127	3	3	3
Irrigation and Drainage	I.D. 149, 160, 147	3	3	3
Structural Design	C.E. 130, 131, 132	3	3	3
Sanitary	Bact. 70, 140, 144	5	3	3
	C.E. 193, 194, 195	3	4	4

*Not required of students electing Sanitary Engineering Option.

†Not required of students taking Advanced Military 101-106.

‡Sanitary Majors should take English 111 in Spring Quarter.

§Students may select courses from more than one option, or may elect other subjects in the college curriculum under the general supervision of the Dean, and will be classed as majors in General Engineering.

COURSES

59. **Blue Print Reading and Industrial Drawing.** Primarily for majors in Business Administration. The reading and interpretation of blue prints, use of instruments, lettering, and elementary drawing, including construction of graphs, flow charts, etc. Three credits. Winter, M. W. F. 2-5. *Daines*

60. **Elementary Drawing.** Primarily for Forestry students. The use of instruments, simple lettering, and drawing. One credit. Winter, T. or Th. 2-5. *Staff*

61. **Engineering Drawing.** Use of instruments, lettering, applied geometry, orthographic projection, and technical sketching. Two credits. Fall, T. Th. 8-11, M. W. F. 10-12, M. W. 2-5, T. Th. 2-5. Winter, T. Th. 8-11. *Staff*

62. **Advanced Engineering Drawing.** Pictorial representation, conventional representation, dimensioning, working drawings and lettering. Prerequisite: C.E. 61. Two credits. Winter, T. Th. 8-11, M. W. F. 10-12, M. W. 2-5, T. Th. 2-5. Spring, T. Th. 2-5. *Staff*

63 **Descriptive Geometry.** Principal and auxiliary views; points, lines, and planes; developments, intersections, and warped surfaces; mining problems. Prerequisites: C.E. 61, Mech. Draw. 91, or L.A. 20. Three credits. Fall, T. 8-12, Th. 8-11; Spring, T. 8-12, Th. 8-11; M. 10-1, W. F. 10-12; M. 2-5, W. F. 2-4. *Staff*

65. **Engineering Problems.** Practical Engineering problems solved by the use of algebra and trigonometry. Methods of computations include the use of logarithms, slide-rule, and calculating machines. Special emphasis is placed upon the development of good habits of work and study. Prerequisite: Math. 46. One credit. Fall, Spring. *Tingey*

81. **Plane Surveying.** Primarily for Foresters. Use of tape, hand level, level, transit, compass, etc. Differential and profile leveling, traversing, plotting, mapping, and care of engineering instruments. Prerequisites: Math. 35 and 46. Three credits. Fall, Lec. M. W. 1; Lab., arranged. *Staff*

82. **Mapping and Office Practice.** Practice in mapping of the various kinds of surveys that may be encountered by the engineer in working up field notes. Prerequisite: C.E. 81 or 84. Three credits. Winter. Time arranged. *Staff*

83. **Plane Surveying.** Topographical surveying and mapping, introduction to route surveying, cross-sectioning, some rural and city surveying, and solar observations. Prerequisites: C.E. 81 and 82. Three credits. Spring, M. W. 1; Lab., arranged. *Staff*

84. **Elements of Surveying.** For Engineers. Theory of surveying. Treminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisites: Math. 35 and 46. Three credits. Fall, M. W. 10 or T. Th. 10; Lab., arranged. *Stock*

85. **Advanced Surveying.** For Engineers. Problems in chaining, leveling, curves, spirals, stadia, plane table surveying, and city surveying. Prerequisites: C.E. 82 and 84. Three credits. Spring, M. W. 10 or T. Th. 10; Lab., T. W. Th. or F. 2-5. *Stock*

87. **Summer Surveying Camp.** Surveying office and field practice in camp. Topographic, land, route, and geodetic surveying. Actual field surveys are made. The student pays his own transportation and living expenses and the regular summer quarter registration fee. Prerequisite: C.E. 85 or equivalent. Seven credits. Summer Session. Six Weeks. Daily 8-5. *Staff*

101, 102, 103. **Engineering Mechanics.** This sequence of three courses includes statics, dynamics, and strength of materials. The Fall Quarter and first part of the Winter Quarter are devoted to the study of resultants and equilibrium of force systems, friction, center of gravity, moment of inertia, and the kinematics and kinetics of bodies in translation, rotation, and plane motion. The remainder of the year is devoted to the study of properties of engineering materials, stress and strain in tension and compression members, shafts, beams, and columns, combined and principal stresses, fatigue, impact, and energy loads and special topics. Prerequisite: Math 99. Four credits, each quarter. Fall, Winter and Spring. M. W. F. 10; Lab., M. or W. 2-5. *Kepner*

105, 106, 107. Structural Theory and Design. The Fall Quarter is devoted to the analysis and design of framed structural elements of steel and timber. This is followed in the Winter Quarter by a study of the analysis and design of portions of buildings and bridges involving the principles studied during the first two quarters. Prerequisites: Engineering Mechanics, C. E. 101, 102, and 103. Fall and Winter. Daily 9; Lab., T. 2-5. Six credits. Spring, M. W. F. 9; Lab., T. Th. 2-5. Five credits. *Kepner*

108, 109, 110. Materials Testing Laboratory. Strength, composition, and physical properties of engineering materials, including wood, concrete, metal and bituminous. One credit each quarter. Fall, Winter and Spring. M. T. or W. *Staff*

120. Roads and Pavements. Elements of highway engineering. Types of roads and pavements, methods of construction and maintenance, jurisprudence, and finance. Prerequisite: C.E. 95. Three credits. Spring, M. W. F. 9. *Stock*

124. Street and Highway Traffic Control. Collection and analysis of traffic data; causes and remedies for traffic congestion and accidents; traffic control devices; illumination of streets and highways; economics and administration of traffic control. Prerequisite: C.E. 120. Three credits. Fall, M. W. 11; Lab., M. 2-5. *Stock*

125. Highway Design. Theory and practice in the design of rural highways. Preparation of highway plans and profiles, mass diagrams, right-of-way surveys, and drainage features. Prerequisite: C.E. 85. Three credits. Winter, M. W. 11; Lab., M. 2-5. *Stock*

127. City Planning. Master plans, civic units, parks and playgrounds, utilities, housing, sub-divisions, zoning, civic center and airports. Three credits. Spring, M. W. F. 11. *Stock*

130. Building Construction and Cost Estimating. Construction methods used in fabrication and erection of buildings and practice in estimating costs. Three credits. Fall, M. W. F. 11. *Kepner*

131, 132. Structural Design Problems. Advanced work in the analysis and design of statically determinate and indeterminate structures. Planned to meet the needs of students desiring to specialize in the structural field. Prerequisite: C. E. 105. Three credits each quarter. Winter and Spring, M. W. F. 11. *Kepner*

141, 142. Fluid Mechanics and Hydraulics. Properties of fluids, the principles of hydrostatics, flow of ideal and real fluids, principles of similarity, the flow of fluids in pipes and open channels, and measurement of fluid flow. Prerequisites: Physics 20 and Math 99. Four credits each quarter. Fall and Winter, T. Th. 8; Lab., arranged. *Milligan*

143. Hydrology and Meteorology. The factors of the hydrologic cycle, including weather elements and climate, precipitation, evaporation, transpiration, infiltration, groundwater, and runoff; methods of collection of hydrologic data and its use in water supply and flood control studies. Prerequisites: C.E. 142 or by special arrangement. Four credits. Fall, M. W. F. 10; Lab., F. 2-5; Spring, M. W. F. 11; Lab., Th. or F. 2-5. *Milligan*

148. Hydraulic Machinery. Hydraulic principles underlying the design and selection of tangential and reaction turbines and centrifugal pumps are studied in this course. Prerequisite: C.E. 142. Four credits. Spring, T. Th. 8; Lab., arranged. *Milligan*

150. Soil Mechanics. Elementary physics of soil as applied to engineering problems. Moisture, plasticity, and capillary relationships. Percolation and seepage, shear, stress distribution, consolidation and stability as factors in the design of earth structures and foundations. Prerequisites: Math. 122, C. E. 103, 110, 142. Four credits. Fall, M. W. F. 8; Lab., W. or Th. 2-5. *Peterson*

181. Photogrammetry. The science or art of utilizing photographs of the earth's surface for making surveys, maps and land utilization studies. Planimetric maps, mosaics and restituted photographs, their construction and uses. Prerequisites: C.E. 63, 83, or 85 or senior standing in Forest, Range, or Wildlife Management, Geology, Landscape Architecture, Aviation, or Advanced Military Science. Three credits. Spring, M. W. 8; Lab., arranged. *Tingey*

190. Contracts and Specifications. Synopsis of the law of contracts. Typical specifications and contracts. Prerequisite: Senior standing in engineering. Three credits. Winter, M. W. F. 8. *Bishop*

192. Engineering Economy. Financial and cost problems associated with engineering design, operation and construction. The determination of the economic alternative in engineering. Engineering economy studies involving interest, level of investment, increment costs, sunk costs, replacement, depreciation, break-even point, minimum cost point, capacity and load factor, etc. are considered. Prerequisite: B.A. 100. Three credits. Winter, M. W. F. 9. *Peterson*

193. Municipal Water Systems. Elements of design, construction, and maintenance of waterworks systems. Prerequisite: C.E. 142. Three credits. Fall, M. W. 10; Lab., Th. 2-5. *Staff*

194. Sewerage. Principles of design, construction and maintenance of sewer systems. Treatment of sewage by physical, chemical, and biological action and methods of final disposal. Prerequisites: C.E. 142 and Bact. 70. Four credits. Winter, M. W. F. 10; Lab., Th. 2-5. *Staff*

195. Sanitary Design. Principles of design, construction, and maintenance of water purification plants and sewage treatment plants. Problems involving both functional as well as structural design features are included. Prerequisites: C.E. 193, 194. Four credits. Spring, M. W. F. 10; Lab., Th. 2-5. *Staff*

196. Elementary Engineering Thermodynamics. The general energy equations, principles of the thermodynamic cycles for internal combustion engines, processes of vapors, air compression, refrigeration, and flow of fluids. Prerequisites: Physics 22 and Math. 99. Four credits. Winter, M. W. F. 11; Lab., Th. or F. 2-5. *Milligan*

197. Electrical Machinery. Theory and performance of electrical machinery. Power transmission and distribution. Applications of electrical machinery. Prerequisites: Physics 21 and Math. 99. Four credits. Fall, M. W. F. 11; Lab., W. or F. 2-5. *Embry*

198, 199. Engineering Seminar and Conferences. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all seniors. Two credits each quarter. Winter and Spring. T. Th. 10. *Christiansen*

201. Advanced Hydraulic Design. Design of pipe lines, special flumes, spillways, water control structures, and hydraulic machinery. Prerequisites: I.D. 147, C.E. 148 and Math. 122. Three credits. Winter. Time arranged. *Milligan*

202. Advanced Structural Analysis. Modern methods of structural analysis, including practice with Begg's Deformeters and the Photo-elastic Polariscope. Prerequisite: C.E. 132. Three credits. Fall, time arranged. *Peterson*

203. Advanced Structural Design. Design and cost comparisons of timber, steel, and masonry structures. Prerequisite: C.E. 132. Three credits. Winter, time arranged. *Peterson*

210. Earth and Rock-Fill Dams. Design of flexible type (earth or rock fill) dams, utilizing naturally available materials. The theories of soil mechanics are used to check designs against criteria for structural stability and stability against seepage. Special attention is given to foundations and construction details. For graduate students and specially prepared seniors. Three credits. Fall, time arranged. *Peterson*

211. Masonry Dams. Design of rigid type dams. Stress analysis and design of gravity, gravity arch, single arch, multiple arch, and deck types of masonry dams. Timber, steel and other miscellaneous types are also considered. Stress and seepage problems in the foundations and abutments and construction details are given special attention. For graduate students and specially prepared seniors. Three credits. Winter, time arranged. *Peterson*

212. Appurtenances to Dams, and Operation of Reservoirs. Hydraulic and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control, and irrigation use. Prerequisites: C.E. 210, 211. For graduate students and specially prepared seniors. Three credits. Spring, time arranged. *Peterson*

215. Hydro-Electric Design. Selection of plant capacity from hydrological information. Effect of storage on capacity. Economic height of dams. Selection of equipment. Layout and arrangement of power plants. For graduate students and specially prepared seniors. Prerequisite: C.E. 148. Three credits. Spring, time arranged. *Peterson*

220, 221, 222. Advanced Highway Engineering. Economics of location and design; selection, improvement, and maintenance; traffic control, administration, finance and jurisprudence as applied to highways. Prerequisite: C.E. 125. Three credits each quarter. Fall, Winter and Spring. Time arranged. *Stock*

242. Advanced Fluid Mechanics. Dynamic lift and propulsion, flow of viscous fluids, resistance of immersed and floating bodies, compressible fluids, and dynamic similarity. Prerequisites: C.E. 142 and 196, or equivalents. Three credits. Any quarter, time arranged. *Milligan*

250. Advanced Soil Mechanics. Theories of seepage and percolation, salinity, capillarity, stresses in earth masses, consolidation, and stability are developed from a mathematical and physical viewpoint, and applied to the practical solution of engineering design of wells, drains, canals, embankments, foundations and miscellaneous earth structures. Interpretation of laboratory tests is given special attention. For graduate students and specially prepared seniors. Prerequisites: Math. 122 and C.E. 150, or its equivalent. Three credits. Winter, time arranged. *Peterson*

298. Graduate Thesis. Two to twelve credits. Each quarter, time arranged. *Staff*

Irrigation and Drainage

J. E. CHRISTIANSEN, C. H. MILLIGAN, O. W. ISRAELSEN, *Professors;* D. F. PETERSON, JR., *Associate Professor;* A. A. BISHOP, *Assistant Professor;* GEORGE D. CLYDE, J. H. MAUGHAN, C. W. LAURITZEN, D. K. FUHRIMAN, WILLIS BARRETT, *Collaborators, U. S. Department of Agriculture.*

Both undergraduate and graduate work leading to Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering, with majors in Irrigation and Drainage, are offered by this department.

The Department also carries on a program of research in collaboration with the Soil Conservation Service and the Bureau of Plant Industry, Soils and Agricultural Engineering, of the U. S. Department of Agriculture, under the direction of the Agricultural Experiment Station. This provides opportunities for qualified students to act as part-time research assistants, and in so doing, to obtain experience and compensation for their services.

Utah State Agricultural College is located in the heart of the irrigated regions of the West. Special emphasis is placed upon the basic principles of engineering applicable to the design, construction, operation and maintenance of irrigation systems, and upon the solution of problems related to irrigation argriculture.

IRRIGATION AND DRAINAGE COURSES

10. Irrigation for Agricultural Students. The principles and practices underlying efficient and economic use of water in irrigation, including land preparation, water measurement, irrigation methods, irrigation efficiencies, and simple structures, for the control and measurement of water. Four credits. Fall or Spring. M. W. F. 9; Lab., M. or T. 2-5. *Bishop*

12. Irrigation Practice. Sources and conveyance of irrigation water, from pumping plants, water measurements, preparation of land for irrigation, soil properties and plant characteristics in relation to irrigation, alkali, duty of water and irrigation efficiencies. Four credits. Fall or Spring, M. W. F. 10; Lab., Th. or F. 2-5. *Bishop*

145. Design of Drainage Systems. Drainage design in relation to soil properties, location of drains, flow into tile, properties of tile, drainage construction. Prerequisites: I.D. 12 and C.E. 142. Three credits. Spring, M. W. 8; Lab., F. 2-5. *Israelsen*

146. Design of Water Conveyance Irrigation Structures. Application of the principles of solid, fluid and soil mechanics, to the solution of engineering designs for earth canals, lined canals, flumes, transitions, and pipe lines. Prerequisites: C.E. 106, 142, 150. Three credits. Winter, T. Th. 8; W. 2-5. *Bishop*

147. Design of Water Control Irrigation Structures. Design of dams, diversion works, drops and chutes, spillways, wasteways, headgates, and check gates. Prerequisite: I.D. 146. Three credits. Spring, T. Th. 8; W. 2-5. *Bishop*

149. Irrigation Institutions. Laws governing the acquirement, adjudication, and administration of water rights; state water codes, mutual companies, commercial companies, irrigation and drainage districts; Federal legislation affecting water. Three credits. Fall, M. W. F. 11. *Bishop*

160. Management of Irrigation Systems. Details of staff organization for irrigation systems. Distribution of water to irrigators. Financing for construction and operation. Maintenance of canals, flumes, pipe lines, dams, weirs and other irrigation structures. Prerequisite: I.D. 149. Three credits. Winter, M. W. F. 11. *Bishop*

212. Problems in Irrigation Agriculture. Advanced work on the major problems in agriculture under irrigation, including management of irrigation projects, consolidation of irrigation companies, formation of soil conservation districts, irrigation efficiencies, erosion control, irrigation and the alkali problem. Instruction in residence or in absentia. Each quarter. Time arranged. Credit according to work done. *Staff*

241. Research in Irrigation and Drainage. The regular research activities of irrigation and drainage staff members afford excellent opportunities for direction of student research projects. A qualified student may elect a problem in any phase of irrigation or drainage in civil engineering for study at the College or elsewhere. Results in research may be used in part to meet the requirements of an advanced degree. Credit according to work done. Each quarter. Time arranged. *Staff*

249. Advanced Irrigation Institutions and Management. Problems in laws governing the acquirement and adjudication of water rights, and in the distribution of water, according to established rights; the improvement of irrigation and drainage enterprises; and operation problems. Instruction in residence or in absentia. Each quarter. Time arranged. Credit according to work done. *Milligan*

298. Graduate Thesis. Two to twelve credits. Each quarter. Time arranged. *Staff*

DIVISION OF TECHNOLOGY

ERNEST C. JEPPSEN, *Chairman.*

The Division of Technology is one of the two divisions in the School of Engineering and Technology. It is composed of seven departments, namely: Aeronautics, Air Conditioning and Refrigeration, Automotive, Metalwork and Mechanical Drawing, Radio and Electronics, Woodwork and Building Construction, and Industrial Education.

Beginning as a Department of Mechanic Arts in 1888, this work has expanded and developed into the present Division of Technology with seven separate Departments. This growth is a result of efforts of this Institution to provide for the "liberal and practical education of the industrial classes" as outlined in the original charter for Land-Grant Colleges and Universities.

This Division, in an attempt to better meet the needs of the students, offers three major programs, which are:

I. Technical Institute Program. Preparation for technicians and for supervisory and managerial staff in the following industrial fields:

A. Aeronautics
B. Air Conditioning and Refrigeration
C. Automotive and Diesel
D. Metalwork and Mechanical Drawing
E. Radio and Electronics
F. Woodwork and Building Construction

The completion of any curriculum in this program leads to the Bachelor of Science Degree in Technology.

II. Industrial Education Program. Preparation for teachers and supervisors in:

A. Industrial Arts Education, for the Junior and Senior High Schools.
B. Trade and Industrial Education, for the Junior Colleges and Vocational Schools

The completion of either curriculum in this program leads to the Bachelor of Science Degree in Industrial Education.

The Master of Science curriculum is available for students who wish to do graduate work in Industrial Education.

III. Vocational Technical Program. Preparation for skilled workers in the following technical occupations:

A. Acetylene and Electric Welding
B. Aircraft and Engine Mechanics
C. Auto Body and Paint Reconditioning
D. Automotive Repair
E. Commercial Photography
F. Carpentry
G. Diesel and Heavy Duty Mechanics
H. Machine Shop Practice
I. Radio Service and Repair
J. Refrigeration and Air Conditioning

The completion of any curriculum in this program leads to the Technical certificate.

In addition, this Division offers many service courses to accommodate students in other departments on the campus.

I. Technical Institute Program

Present-day industrial projects are designed by the engineer, interpreted and supervised by technicians, and constructed by skilled tradesmen. The Technical Institute Program is a four-year technical program designed to prepare such technicians for modern industry. This program provides an excellent foundation for entrance into industrial Civil Service occupations or private business. It also prepares supervisory and managerial staff for large industrial organizations. The Technological Curricula that follow are described under the departments in which they are listed.

Aeronautics

.....; LOWELL P. SUMMERS, LOUIS KLEIN, JR., *Instructors.*

This department offers instruction for the thorough training of skilled aircraft and aircraft engine mechanics and aeronautical technicians.

Its curricula, equipment, and instructors have been certified, giving it a rating as an approved school for training of aircraft and engine mechanics. Satisfactory completion of the two-year curriculum qualifies graduates to apply for both Civil Aeronautics Administration Airplane and Airplane Engine mechanic certificates. This training fits the graduate for both airlane and manufacturing employment. Training is based upon the definite objective of scientifically and systematically developing students to a point where they can assume a responsible position in the industry.

The College is a fully certified Air Agency of the Federal Government. It holds Certificate No. 1175 covering training of combined aircraft and aircraft engine mechanics.

The facilities consist of complete laboratories and equipment for instruction in aircraft engines, propellers, general aircraft mechanics, and aircraft hydaulics. All of these laboratories are equipped with the latest type of airplanes, engines, propellers, and other units necessary for training in these fields. Also included are electro-plating, magneto and carburetor testing, and sandblast equipment. Supplementary to the aircraft laboratories are the Machine Shop, Sheet Metal, Welding, and Woodwork Departments.

CURRICULUM

Degree: Bachelor of Science in Aeronautical Technology

Freshman

Course	Credits F	W	S
Aero 5, 6, 7	5	5	5
Aero 5a, 6a, 7a	5	5	5
Math. 34, 35, 44	3	5	3
M. W. 51b	—	3	—
Radio 21	4	—	—
Electives	—	—	4
M. S. 1, 2, 3	1	1	1
	18	19	18

Sophomore

Course	Credits F	W	S
Aero 8, 9, 10	5	5	5
Aero 8a, 9a, 10a	5	5	5
English 17, 18, 19	3	3	3
Welding 92, 93	—	3	3
Drawing 91, 92, 93	2	2	2
Electives	2	—	—
M. S. 4, 5, 6	1	1	1
	18	19	19

Junior

Course	Credits F	W	S
Aero 100, 104, 105	3	3	3
Physics 20, 21, 22	5	5	5
Chemistry 10	—	—	5
Drawing 95, 96, 197	3	3	3
M. W. 50	—	3	—
Electives	5	2	1
	16	16	17

Senior

Course	Credits F	W	S
Aero 101, 126, 127	3	2	2
Aero 37, 131	3	—	2
Labor Econ. 125	3	—	—
B. A. 151, 100, 156	3	3	5
English 111	—	—	4
Zoology 111	—	4	—
Electives	3	6	2
	15	15	15

DESCRIPTION OF COURSES

5, 5a. Composite Aircraft Structures. (Technical and Shop.) Training in design, construction, and repair of composite aircraft. Units include wood

structures, steel structures, fabric work and finishing, control systems, landing gears, engine mounts, and pertinent Civil Air Regulations. This is an introduction to aircraft: a study of airfoils, types of aircraft, aircraft structures, parts and fittings, design factors, methods of fabrication, materials and processes, stress and strain. Fall. Technical, five credits, Daily 1; Shop, five credits, Daily 2-5. *Klein*

6, 6a. All-Metal Aircraft Structures. (Technical and Shop.) Training in design, construction, and repair of all-metal aircraft. Units include lay out, template and flat plate development, bend allowance, hand forming, riveting procedure, special tool construction, power press and power shear operation, heat treatment, corrosion prevention, and pertinent Civil Air Regulations. This is the adaptation of stressed skin aircraft construction: a study of strength, weight and use of aluminum alloys; design factors; methods of fabrication; fittings, forgings, and extrusions; monocoque, and semi-monocoque structures; stress and strain; material and processes. Winter. Technical, five credits, Daily 1; Shop, five credits, Daily 2-5. *Klein*

7, 7a. Aircraft Maintenance. (Technical and Shop.) Training in maintenance operation, repair and alteration of modern aircraft and miscellaneous equipment. Units include aircraft hydraulics, aircraft instruments, aircraft electrical equipment; installation and general servicing of components; landing gears and retracting mechanisms; rigging; weight and balance computations; engine and propeller installations; periodic inspections; procedure recording of repair and alterations; time and material cost estimates; material and equipment requirements; and pertinent Civil Air Regulations. This is a thorough study of the operation of an approved Civil Aeronautics Administration Aircraft Repair Station. Spring. Technical, five credits, Daily 1; Shop, five credits, Daily 2-5. *Klein*

8, 8a. Aircraft Powerplants. (Technical and Shop.) Training in design, operation, and repair of modern air cooled and liquid cooled aircraft engines. Units include power sections, accessory sections, reduction gears, cylinders and valve mechanisms, supercharger sections, and pertinent Civil Air Regulations. This is an introduction to high performance aircraft internal combustion engine: A study of specifications and tolerances, horsepower curves, M.E.P., B.M.E.P., B.H.P., design factors, magnetic and microscopic inspection methods, materials and processes, volumetric efficiency, and compression ratios. Fall. Technical, five credits, Daily 1; Shop, five credits, Daily 2-5. *Summers*

9, 9a. Aircraft Powerplant Accessories. (Technical and Shop.) Training in design, operation and repair of modern aircraft engine accessories. Units include float and diaphragm type carburetors, fuel injection systems, lubricating systems, magnetos, generators and voltage control systems, batteries, starters; vacuum hydraulic and fuel pumps; pertinent Civil Air Regulations. This is a study of combustion and combustible mixtures, electricity and magentism, induction systems and superchargers, fuels and lubricants. Winter. Technical, five credits, Daily 1; Shop, five credits, Daily 2-5. *Summers*

10, 10a. Aircraft Powerplant Maintenance. (Technical and Shop.) Training in maintenance, operation, repair and alteration of modern aircraft powerplants. Units include periodic inspections; airline maintenance service; diagnosis of engine malfunctioning; engine installation, test, and servicing; lubricating and fuel systems; hydromatic, constant speed, controlable pitch, and wood propellers; equipment, tool and instrument requirements for repair station operation; major and minor engine repair and alterations; time and material cost estimates; pertinent Civil Air Regulations. This is a thorough study of the operation of an approved Civil Aeronautics Administration Engine Repair Station. Spring. Technical, five credits, Daily 1; Shop, five credits, Daily 2-5. *Summers*

100. Fundamentals of Turbo-Jet Propulsion. General principles of jet propulsion devices. Consideration of compressors, combustion chambers, and turbines with their application to jet power plants. Prerequisite: Aero 10, 10a. Fall. Three credits. M. W. F. 1. *Summers*

101. Advanced Engine Operation and Performance. Principles underlying the relationships between altitude, power output, and fuel consumption of aircraft engines. Torque stand testing, fuel and octane rating. Analysis and summarizing of test data. Fall. Three credits. M. W. F. 2. *Summers*

104. Advance Airplane Design and Construction. Study of latest methods in current use for developing analysis of stressed skin aircraft. Theory of elasticity, reinforced sheet in compression, graphic representation of bending moments and loads. Problems involved in the design of an airplane. Winter. Three credits. M. W. F. 1. *Staff*

105. Aircraft Woods and Plastics. Analysis of woods and plastics as applied to aircraft. Emphasis on investigation and development of methods involving design criteria, applications of elastic theory, and effects upon structural analysis. Two credits. Winter. T. Th. 10. *Klein*

126. Airline Maintenance and Fixed Base Operation. Administrative problems of airline and airport management; unit organization; personnel problems; relationships with Civil Aeronautics Administration; interline agreements; promotion and publicity. Winter. Two credits. T. Th. 2. *Staff*

127. Aircraft Communication and Range Techniques. The standard airport control procedures: instrument flight regulations; control tower procedure and flight plans; orientation and beam bracketing; approach procedures and let down. Instruction correlated with Link trainer operation. Spring. Two credits. Lecture, T. Th. 3; Lab., T. Th. 3-5. *Staff*

130. Aeronautics Seminar. Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. Spring. Two credits. Time arranged. *Staff*

131. Time and Motion Study. The techniques of time and motion study and their inter-relationships. Detailed discussion and practice with process charts, multiple-activity charts, micromotion study, Therblig check lists, motion economy and stop watch time study. Methods of application and personnel problems involved. Spring. Two credits. M. W. 11. *Klein*

AERONAUTICAL GROUND AND FLIGHT SCHOOL

The Aeronautics Department, in cooperation with the Veterans Administration, provides a coordinated Flight Instruction Program for Veterans. It consists of Ground School Courses in the Aeronautics Department at the College and Flight Courses at either of the local airports. This Flight Instruction Program is open to any veteran approved for flight training in terms of his Educational Objective. For further information the veteran should contact the Dean of his school.

GROUND SCHOOL COURSES:

31. Civil Air Regulations, Radio, and Airway Procedures. Rules and regulations pertaining to the operation of aircraft. Orientation in the practical use of radio, and airway procedures in compliance with Civil Air Regulations. Two credits. Any quarter. T. Th. 2. *Summers*

32. General Service and Operation of Aircraft. Aeronautical Ground School (Primary). A study of the theory of flight; construction, inspection, care and maintenance of aircraft and aircraft engines. Required by Civil Aeronautics Administration for private pilot certification. Two credits. Any quarter. T. Th. 3. *Klein*

33. Meteorology. Aeronautics Ground School. The study of weather, weather maps, structure of the atmosphere, air masses, clouds, forecasting and weather reports. This is Civil Aeronautics Administration prescribed material for any pilot rating above private. Three credits. Any quarter. T. Th. 4. *Staff*

34. Navigation. Aeronautical Ground School. The study of maps, charts, wind drift, aircraft instruments, radius of action, and other navigation problems. This is Civil Aeronautics Administration prescribed material for any pilot rating above private. Two credits. Any quarter. T. Th. 1. *Staff*

135. Aeronautical Ground School. (Advanced.) Prerequisite: Aero 32. Intensive course in airplanes and airplane engines; aircraft materials and construction, and inspection; fuels and lubricants; starting mechanisms and variable pitch propellers; general aircraft maintenance. Five credits. Winter, Daily 10. *Staff*

FLIGHT COURSES:

37. Private Pilot Certificate. Aeronautical Flight School (Primary). Prerequisites: Aero 31 and 32. Designed to meet C. A. A. requirements for the private pilot certificate. It consists of flight training for a minimum of 35 hours or a maximum of 50 hours. This includes at least 17 hours' dual flight instruction and 18 hours' solo flight. Successful passing of all C. A. A. flight and ground tests for the private pilot's certificate is required for satisfactory completion of this course. Three credits. Any quarter. *Staff*

137. Commercial Pilot Certificate. Aeronautical Flight School (Advanced). Prerequisites: Aero 31, 32, 33, 34; or, Private Pilot Certificate and Aero 33, 34. Designed to meet requirements of Civil Aeronautics Administration for commercial pilot's certificate. It covers the aerodynamics of the maneuvers comprising the primary flight course with their interpretation and application to heavier aircraft. It also emphasizes precision, cross country flight, and such advanced maneuvers as will further develop the student's flight knowledge and technique. Some night flying practice is suggested but not required. Successful passing of all C. A. A. flight and ground tests for the Commercial Pilot Certificate is required. Minimum total flight hours: 200 solo clock hours, 20 clock hours of which must be cross-country. Ten credits. Any quarter. Time arranged. *Staff*

138. Flight Instructor Certificate. Aeronautical Flight School (Advanced). Prerequisite: Aero 137. Designed to meet C. A. A. requirements for flight instructor certificate. It consists primarily of the practical application of elementary and advanced flight instructing in compliance with and according to Civil Air Regulations. Successful passing of all C. A. A. flight and ground tests for the flight instructor certificate is required. Two credits. Any quarter. Time arranged. *Staff*

139. Instrument Rating. Aeronautical Flight School (Advanced). Prerequisite: Aero 137. Designed to meet C. A. A. requirements for instrument rating certificate. It consists of advanced problems in flight, navigation and meteorology. The student is taught to fly aircraft over prescribed routes and areas in all weather conditions by means of instruments and radio. The flight work involves clear weather and bad weather practice, under the hood flying, the various methods of using radio beacons and sectors, the use of electronic flying aids, instrument take-offs and landings, homing devices, radio compasses, and direction finders. Successful passing of all C. A. A. flight and ground tests for the instrument rating certificate is required. Two credits. Any quarter. Time arranged. *Staff*

Air Conditioning and Refrigeration

J. C. SHARP, *Assistant Professor;* D. W. MANDER, ..., *Instructors.*

This department offers instruction for the thorough training of skilled technicians in air conditioning and refrigeration and allied fields. These allied fields include: (1) winter heating of small commercial buildings and homes, (2) sheet metal work, and (3) domestic appliances.

The courses of study are arranged to meet the needs of the industry and the requirements of the various national societies interested in air conditioning

and refrigeration. A chapter of the Refrigeration Service Engineers Society (an international organization) is established on the campus and majors in this department are afforded the opportunity to join this society.

The air conditioning and refrigeration shops are new and contain excellent equipment for the thorough study of domestic and commercial refrigeration, air conditioning, and sheet metal work. The shops are equipped with the newer type test instruments and tools for the practical and complete testing of all equipment in these fields.

CURRICULUM

Degree: Bachelor of Science in Air Conditioning and Refrigeration.

Freshman

Course	Credits F	W	S
AC & R 1, 2, 11	5	5	5
AC & R 1a, 2a, 11a	5	5	5
Math 34, 35, 44	3	5	3
Drawing 91, 92	—	2	2
Radio 21	4	—	—
M. S. 1, 2, 3	1	1	1
	18	18	16

Sophomore

Course	Credits F	W	S
AC & R 12, 21, 22	5	5	5
AC & R 12a, 21a, 22a	5	5	5
English 17, 18, 19	3	3	3
Drawing 93	2	—	—
M. W. 51b	—	—	3
Welding 91	—	3	—
Sheet Metal 61	—	2	—
M. S. 4, 5, 6	1	1	1
	16	19	17

Junior

Course	Credits F	W	S
AC & R 150, 151, 170	3	3	3
Physics 20, 21, 22	5	5	5
Econ. 51	—	5	—
Bact. 1 & 2	5	—	—
Dairy 102	—	—	5
Electives	3	3	3
	16	16	16

Senior

Course	Credits F	W	S
AC & R 111, 121, 161	3	3	3
B. A. 55	—	—	4
B. A. 151, 100, 156	3	3	5
English 111	4	—	—
Electives	5	9	3
	15	15	15

Description of Courses

1, 1a. Domestic Refrigeration, Open Types. (Technical and Shop.) Training in the construction, operation, servicing, and repair of domestic refrigerators of the open type. The units include compression cycle, compressors, automatic controls, refrigerants, electric motors, and accessories used in open type domestic refrigeration systems. This is the basic course for all vocational students in refrigeration. Fall. Technical, five credits. Daily 8; Laboratory, five credits. Daily 9-12. *Mander*

2, 2a. Domestic Refrigeration, Sealed Types. (Technical and Shop.) Training in the construction, operation, servicing, and repair of domestic refrigerators of the sealed type. The units include hermetic compression cycles, hermetic compressors, absorption cycles, automatic controls, electric motors, and accessories used in sealed type domestic refrigeration systems. Service and repair of cabinets used in domestic refrigerators are also included. Winter. Technical, five credits. Daily 8; Laboratory, five credits. Daily 9-12. *Mander*

6. Household Refrigeration. Principles and practices in construction, operation, and servicing of modern household refrigerators and home freezer equipment. The units of the course include motors, compressors, freezing units, temperature controls, and cabinets. Open to any college student. Three credits. Fall, Winter, and Spring. Lecture T. Th. 2; Laboratory T. Th. 3-5. *Sharp*

11, 11a. Commercial Refrigeration, Single Systems. (Technical and Shop.) Training in the construction, operation, servicing and repair of single system commercial refrigerators. The units of this course include commercial boxes, commercial compressors, condensers, evaporators, pressure reducing devices, and controls. The course emphasizes the calculation and selection of proper size units so that a complete commercial refrigeration system will operate correctly. Special work will be done in studying and testing commercial refrigerators in actual operation in relation to capacity, efficiency, and operating characteristics. Spring. Technical, five credits, Daily 8; Laboratory, five credits, Daily 9-12. *Mander*

12, 12a. Commercial Refrigeration, Multiple Unit. (Technical and Shop.) Training in the construction, operation, servicing and repair of multiple type commercial refrigerators. The units include commercial low side floats, two-temperature valves, electric solenoids, two position and modulating shut-off valves, Temprite valves, pressure controls, and carbonators. Multiple units are assembled, run, and tested for the various service problems encountered in commercial servicing of high, medium, and low temperature work. Fall. Technical, five credits, Daily 1; Laboratory, five credits, Daily 2-5. *Sharp*

21, 21a. Air Conditioning, Domestic Types. (Technical and Shop.) Training in the design, construction, operation, servicing, and repair of domestic air conditioning equipment. The units include sling psychrometers, psychrometic charts, humidistats, thermostats, desert coolers, unit air-conditioners, filters, U tube water gauges, draft gauges, hygrometers and anamometers. Winter, Technical, five credits, Daily 1; Laboratory, five credits, Daily 2-5. *Sharp*

22, 22a. Air Conditioning, Commercial Types. (Technical and Shop.) Training in the design, construction, operation, servicing, and repair of commercial air conditioning equipment. The units consist of air conditioning compressors, evaporators, duct work, air conditioning controls, pilot tubes, decibel meters, psychological aids, and comfort charts. A typical commercial air conditioning unit will be assembled and used for analyses and correction of operational difficulties encountered in this type of equipment. Prerequisites: AC & R 21 and 61. Spring. Technical, five credits, Daily 1; Laboratory, five credits, Daily 2-5. *Sharp*

61. Air Conditioning Sheet Metal Work. Principles and practices in the use of the sheet metal tools, equipment, and materials; forming, fabrication, and layout techniques as related to the air conditioning industry. Prerequisite: M.D. 93. Two credits. Winter. Two three-hour labs. per week. Time arranged. *Staff*

62. Sheet Metal Work for Building Trades Students. Principles and practices in the use of sheet metal tools, equipment, materials; forming and fabrication; layout techniques as related to the building trades. Two credits. Winter. Time arranged. Two three-hour labs. per week. *Staff*

110. Low Temperature Refrigeration. Advanced technical training in the principles, construction, operation and repair of low temperature refrigeration equipment. Prerequisites: AC & R 12 and 12a. Winter. Three credits. Lecture, T. Th. 2; Lab., T. Th. 3-5. *Sharp*

121. Industrial Air Conditioning. Advanced technical training in the principles, construction, operation and repair of industrial air conditioning equipment. Prerequisites: AC & R 22 and 22a . Three credits. Spring. Lecture, T. Th. 2; Lab., T. Th. 3-5. *Staff*

150. Electric Motors. Advanced technical training in the principles, construction, operation and repair of the motors used in air conditioning and refrigeration equipment. Prerequisite: Radio 21. Three credits. Fall. Time arranged. Lecture, T. Th. 2; Lab., T. Th. 3-5. *Mander*

151. Air Conditioning Electric Circuits. Advanced technical training in the principles, construction, operation and repair of the electric circuits used in air conditioning and refrigeration. Prerequisite: Radio 21. Three credits. Winter. Lecture, W. F. 2; Lab., W. F. 3-5. *Mander*

161. Stokers and Oil Burners. Technical training in the principles, construction, operation and repair of the modern coal stokers and oil burners. Prerequisites: AC & R 22 and 22a. Three credits. Spring. Lecture, W. F. 2; Lab., W. F. 3-5. *Sharp*

170. Applications of Thermodynamics. A course designed exclusively for Air Conditioning and Automotive majors. The applications of the laws of thermodynamics to combustion engines, compressors, vapor cycles, and refrigerators will be studied. Prerequisites: Math 35, 44 and Physics 21. Three credits. Spring. Three lecture periods per week. Time arranged. *Sharp*

190, 191, 192. Advanced Laboratory Work. Advanced laboratory work in the construction, testing, and repair of specialized air conditioning and refrigeration equipment. For junior and senior students majoring in Air Conditioning and Refrigeration. Three credits per quarter. Two lab. and one lecture per week. Time arranged. *Sharp*

Automotive

EDWARD L. FRANCE, *Assistant Professor;* CLYDE HURST, OWEN SLAUGH, LYNN WILLEY, ..., ..., *Instructors.*

This department offers instruction in Automotive, and Diesel Technology; Automotive, and Diesel Mechanics; and Auto Body and Paint Reconditioning. It also provides general service courses designed to meet the needs of those who desire only a fundamental knowledge of the various phases of the automotive field. These courses, namely, Auto 51, 52, 53, 61, 62 and 162, are open to any college student.

Automotive instruction at this institution has kept pace with the rapid advancement of industry in that the latest and most modern servicing equipment has been acquired for training purposes. Instruction in the automotive field has always proven popular. Graduation affords many excellent opportunities for employment in this large and important industry.

The Degree of Bachelor of Science is offered in Automotive or Diesel Technology. A major in these fields prepares a student as an automotive or diesel technician who can better interpret the designs of the engineer and direct the work of the repairman. This major also prepares a student for work as a shop foreman, shop superintendent, or with special preparation, as a vocational instructor. This curriculum also lays an excellent foundation for entrance into Civil Service, private business, or into managerial positions with large companies or corporations.

Students wishing to better prepare themselves for graduate study at other institutions in Automotive, Diesel or closely allied fields of engineering, may do so by substituting certain prescribed courses during their junior and senior years.

CURRICULUM

Degree: Bachelor of Science in Automotive Technology

Freshman

Course	Credits F	W	S
Auto 1, 2, 3	5	5	5
Auto 1a, 2a, 3a	5	5	5
Math 34, 35, 44	3	5	3
Drawing 91, 92	—	2	2
M. W. 51b	3	—	—
M. S. 1, 2, 3	1	1	1
Electives	—	—	2
	17	18	18

Sophomore

Course	Credits F	W	S
Auto 4, 5, 6	5	5	5
Auto 4a, 5a, 6a	5	5	5
English 17, 18, 19	3	3	3
Radio 21	4	—	—
Econ. 51	—	5	—
Welding 91	—	—	3
M. S. 4, 5, 6	1	1	1
	18	19	17

Junior

Course	Credits F	W	S
Welding 190	3	—	—
Auto 162	—	2	—
A. C. & R. 170	—	—	3
Physics 20, 21, 22	5	5	5
Chemistry 10	5	—	—
B. A. 100	—	3	—
M. W. 50	—	3	—
English 111	—	—	4
Electives	3	3	4
	16	16	16

Senior

Course	Credits F	W	S
Auto 151, 152, 153	3	3	3
Zoology 111	—	4	—
Economics 125	3	—	—
B. A. 151, 152, 156	3	3	5
I. E. 113	—	—	3
Electives	6	5	4
	15	15	15

For a Major in Diesel Technology, subsitute Auto 21 to 23 and 21a to 23a for Auto 1 to 3 and 1a to 3a.

Description of Courses

1, 1a. Steering Correction. (Technical and Shop.) Training in the construction, operation, and repair of the parts of the automobile chassis. The units covered are axles, wheels, control linkage, wheel suspension, steering gears, wheel alignment, wheel balancing, frame straightening, and brakes. Modern methods of repair. Fall. Technical, five credits, Daily 8; Shop, five credits, Daily 9-12. *Slaugh*

2, 2a. Automotive Engines. (Technical and Shop.) Training in the construction, operation, and repair of the modern automobile engine. The units of this course include cylinder blocks, piston assemblies, crankshaft assemblies, valve assemblies, cooling and lubricating systems. Modern methods of repair. Winter. Technical, five credits, Daily 8; Shop, five credits, Daily 9-12. *Slaugh*

3, 3a. Driving Mechanisms. (Technical and Shop.) Training in the construction, operation and repair of clutches, transmissions, overdrives, universals, drive shafts, differentials, and real axles. Modern methods of repair. Spring. Technical, five credits, Daily 8; Shop, five credits, Daily 9-12. *Slaugh*

4, 4a. Fuel Systems. (Techincal and Shop.) Training in the construction, operation and repair of gasoline tanks, fuel systems, carburetors, manifolds, controls, and special devices such as supercharges, governors, and auto diesel engine fuel systems. Modern methods of repair. Fall. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *France*

5, 5a. Auto Electrics. (Technical and Shop.) Training in the construction, operation and repair of the electric systems used on the modern automobile. The units in this course include the battery, lighting systems, ignition systems, starting and generating systems. Modern methods of repair. Winter. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *France*

6, 6a. Motor Tune-Up. (Technical and Shop.) This work correlates the work covered on engines, carburetion and electrics. Tests for troubles will be made with modern tune-up equipment and these troubles remedied by trade accepted methods. Spring. Technical, five credits, Daily 9; Shop, five credits, Daily 101. *France*

12, 12a. Fender Reconditioning. (Technical and Shop.) Training in roughing out, shrinking, loading, buffing, sanding, and metal finishing of fenders. General use of the spray gun in applying primer surfacers. Fall, Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Willey*

13, 13a. Body Reconditioning. (Technical and Shop.) Training in the construction and repair of automobile bodies. Units include the checking and alignment of the automobile bodies, repair and replacement of damaged body panels, such as the dash, cowl, trunk, rocker, floor, side, top, and door panels; and repair and adjustment of body mechanisms. Winter. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Willey*

15, 15a. Automotive Trimming and Refinishing. (Technical and Shop.) Training in the repair and replacement of all auto body trim, the preparation of body metal for the various kinds of finishes, and the application of these finishes. Units covered will include repair and replacement of floor coverings, door and rear quarter trim, head lining, cowl pads, seat cushions, windlace and accessories. Practice also will be given in metal preparation, priming, surfacing, application of color, and in spotting and striping. Spring. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Willey*

21, 21a. Heavy Duty Chassis. (Technical and Shop.) Training in the construction, operation and repair of automotive diesel and heavy duty chassis. This course covers heavy duty axles, wheels, control linkage, wheel suspensions, steering gears, wheel alignment, frame straightening, and brakes. Fall. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Hurst*

22, 22a. Automotive Diesel Engines. (Technical and Shop.) Training in the construction, operation and maintenance of automotive Diesel engines. This course covers two-stroke cycle and four-stroke cycle automotive, truck and tractor engines together with their accessories. Winter. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Hurst*

23, 23a. Heavy Duty Drives. (Technical and Shop.) Training in the construction, operation and maintenance of driving mechanism powered by automotive Diesel and other heavy duty engines. Spring. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Hurst*

51. Automobile Chassis. Principles and practice in the construction, operation, and servicing of the modern automobile chassis. The units of the course include axles, wheel suspension, steering gears, frames, springs, universals, drive shafts and brakes. Open to any college student. Three credits. Fall. Lecture, T. Th. 2; Lab., T. Th. 3-5. *Hurst*

52. Automobile Power Plants. Principles and practice in the construction, operation and servicing of the modern automobile power plant. The units of the course include cylinder block assemblies, piston assemblies, crankshaft assemblies, valve assemblies, clutches, transmissions, overdrives; fuel, cooling and lubrication systems. Open to any college student. Three credits. Any quarter. Lecture, M. W. 2; Lab., M. W. 3-5. *Slaugh*

53. Automobile Electricity. (Prerequisite, Auto 52.) Principles and practice in the construction, operation, and servicing of the electrical systems used on the modern automobile. The units to be covered include starting, generating, lighting, ignition, and special accessory systems. Three credits. Spring, Lecture, T. Th. 2; Lab., T. Th. 3-5. *France*

61. Body and Fender Repair. Principles and practice in the fundamentals of fender and body repairing, including work in metal finishing, light welding, door and body alignment. Open to any college student. Three credits. Fall, Lecture, M. W. 2; Lab., M. W. 3-5. *Willey*

62. Upholstering. Principles and practice in the repair of modern upholstery. Rebuilding and recovering of automobile upholstery and home furniture. A practical course in upholstery repair. Open to any college student. Three credits. Winter, Lecture, T. Th. 2; Lab., T. Th. 3-5. *Willey*

151. Carburetion. (Prerequisite: Auto 52 or its equivalent.) Advanced technical training in fuels and carburetion as applied to the modern automobile. Units covered will include fuel pumps, carburetors, manifolds and controls. Also principles of combustion, compression and exhaust gas analysis. Three credits. Fall. Lecture, M. W. 2; Lab., M. W. 3-5. *France*

152. Motors and Generators. (Prerequisite: Auto 53 or its equivalent.) Advanced technical training in the principles, construction, operation and repair of the automobile starting motor, generator, and their controlling devices. Three credits. Winter, Lecture, M. W. 2; Lab., M. W. 3-5. *France*

153. Magnetos. (Prerequisite: Auto 53 or its equivalent.) Advanced technical training in the principles, construction, operation and repair of low and high tension magnetos and their accessories. Three credits. Spring. Lecture, M. W. 2; Lab., M. W. 3-5. *France*

162. Metal Refinishing. (Prerequisite: Auto 61.) Principles and practice in preparing of metal for refinishing. Fundamental procedures in priming, surfacing, and applying of lacquer and enamel. Three credits. Spring. Lecture, T. Th. 2; Lab., T. Th. 3-5. *Willey*

Metalwork and Mechanical Drawing

The Department of Metalwork and Mechanical Drawing is composed of four major units. They are: Machine Practice, Welding, Forging, and Mechanical Drawing. While these units have separate laboratories and are complete within themselves, yet they function together as a coordinated program in Metalwork.

The department, through each of its four major units, offers general service courses for those students desiring basic instruction in Metalwork. It also offers two-year courses for those students preparing to enter the skilled occupations.

A curriculum leading to the Bachelor of Science Degree in the Technology of Metalwork with majors in Machine Practice or in Welding is available. The description of the courses in each of the units of this department follows:

MACHINE PRACTICE

AARON NEWEY, *Professor Emeritus;* FREDERICK PREATOR, *Associate Professor;* G. MERRILL SHAW, *Assistant Professor;* W. KARL SOMERS, *Instructor.*

The degree course in Machine Practice offers to young men with special aptitudes in mechanical work, drafting, and mathematics an excellent opportunity to train for machine-work and tool-making; also, it lays a foundation for entering such allied fields as machine designers, master mechanics, airplane mechanics, or designers in several branches of Engineering.

The shop courses in this unit give good training for students who are studying for a career where mechanical work is needed. Students preparing for engineering, electrical work, auto mechanics, aviation, tractor work, farm machinery, and those interested in model building and experimenting will find these courses suited to their needs.

The Machine Shop has a floor space of 5,080 square feet. It is equipped with the following machine tools: 25 lathes, 3 milling machines, 3 shapers, 1 planer, 2 universal cutter grinders, 1 surface grinder, 1 power hacksaw, 5 drill presses, 5 tool grinders and 1 Doall machine. The shop is well supplied with machinist hand tools, such as vises, bench tools, reamers, gauges, twist drills, taps, dies, micrometers, and other measuring tools. It also has a heat treating laboratory equipped with 5 electric furnaces, tensile test machine, hardness testing machine and polishing equipment for preparing metal specimens.

CURRICULUM

Degree: Bachelor of Science in Metalwork

Freshman

Course	Credits F	W	S
English 17, 18, 19	3	3	3
M. W. 51, 52, 53	5	5	5
Math 34, 35, 44	3	5	3
M. D. 91, 92, 93	2	2	2
M. W. 50	—	—	3
M. S. 1, 2, 3	1	1	1
Electives	3	2	1
	17	18	18

Sophomore

Course	Credits F	W	S
Math 97, 98, 99	5	5	5
Chemistry 10, 11	5	5	—
Physiology 4	5	—	—
Speech 1	—	5	—
M. W. 151b, 151c	—	3	3
Econ. 51	—	—	5
C. E. 63	—	—	3
M. S. 4, 5, 6	1	1	1
Electives	2	—	—
	18	19	17

Junior

Course	Credits F	W	S
Physics, 20, 21, 22	5	5	5
M. W. 152b, 152c	3	—	3
B. A. 55	—	3	—
P. S. 12, 13	—	3	3
W. W. 61b, 61c	—	3	3
English 111	4	—	—
Bact. 155	3	—	—
Welding 91	—	—	3
Electives	2	2	—
	17	16	17

Senior

Course	Credits F	W	S
M. D. 95	3	—	—
W. W. 160b	3	—	—
M. W. 153b	3	—	—
C. E. 197	—	4	—
M. W. 181, 182	—	5	5
C. E. 101, 102, 103	4	4	4
Welding 93	—	—	3
Electives	3	3	3
	16	16	15

Description of Courses

Any five credit course in Machine work may be completed by taking part of the course during one quarter and the other part during a later quarter. The letters A, B, C, D attached to any five credit course number indicates, respectively, two credits, three credits, three credits and two credits. A and B indicate the first part of the course and C and D the latter part. For example: 51a, two credits; 51b, three credits; 51c, three credits; 51d, two credits.

50. Metals and Heat Treatment. The course is a study of the physical properties, composition, constituents, and heat treatment of metals used in industry. The metals and heat treatment studies will include cast iron, wrought iron, plain carbon steel, alloy steels, brasses, bronzes, aluminum alloys and magnesium alloys. Three credits. Any quarter. Time arranged. *Preator*

51a. Machine Practice for Engineers. This course is designed to acquaint engineering students with basic machine shop operations, which include the use of hand tools, bench work, tool sharpening, and elementary engine lathe and drill press operation. Two credits. Any quarter. Time arranged. *Newey*

51, 52. Machine Practice. Training in the use of hand tools, and in bench work and tool sharpening, together with elementary training on drill press and engine lathe. Tools and machine parts are made that give practice in the operations essential to machine shop work. Included are assignments of reading on machine work subjects, and application of mathematics to machine work. Five credits, each course. Fall, Winter, Daily 9-12 and 2-5. *Somers*

53. Machine Practice. (Shaper and Milling Machines.) An introduction to work on the shaper, planer, and milling machines. A program is outlined to develop the student's ability on these machines so as to give him a broader training for advanced work. Five credits. Spring. Prerequisites: 51 and 52. *Preator*

NOTE: Two and three credit courses in Machine Practice are scheduled each quarter. See Time Schedule Bulletin.

151, 152, 153. General Machine Work. Advanced lathe, planer and milling machine work, grinding milling cutters, making general shop tools, and special shop equipment. Prerequisites: M. W. 51, 52, 53. Five credits each course. Fall, Winter and Spring. Daily 2-5. *Newey and Preator*

181, 182, 183. Tool and Die Making. Introducing tool making as a factor in modern production methods. The making of taps, reamers, cutters, and precision gauges for interchangeability of parts. Milling machine work on plain and spiral gears and designing and making of worm and worm wheel. Surface grinding and an introduction to press cutting and forming operations which is a foremost method of modern production. Prerequisites: M. W. 51, 52, 53. Five credits each course. Fall, Winter and Spring. Daily 2-5. *Preator*

WELDING

A. B. KEMP, J. DONALD WADSWORTH, ..., *Instructors.*

The Welding Unit of the Department of Metalwork and Mechanical Drawing offers progressive instruction in Oxy-Acetylene and Electric-Arc Welding. General service courses are provided for those students wishing a fundamental knowledge of this modern field of industry. A two-year program is available for those students preparing to enter the industry as skilled workers. Students desiring to obtain a degree in Welding Technology can do so by substituting Welding courses for Machine Practice courses for a Major in the Metalwork curriculum.

Modern industry is teeming with opportunities to apply welding to design, processes, materials, machinery and devices. Welding will play a large part in providing food, clothing, shelter, power, and transportation for future civilization. The extent of this development will depend upon the training and preparation of today's youth for tomorrow's industry.

Description of Courses

41, 41a. Acetylene Steel Welding. (Technical and Shop.) Training in fusion welding and cutting of mild steel by means of oxy-acetylene welding equipment. Various techniques and welding positions are studied and practiced, and the A. S. M. E. standard tensile test is made on samples welded in flat position. Included in this course is a careful study of the equipment and safety factors involved. Fall. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Kemp*

42, 42a. Acetylene Cast-Iron Welding. (Technical and Shop.) Training in fusion welding of cast iron, bronze welding, and cutting of cast iron and malleable casting with oxy-acetylene welding equipment. Special problems in the pre-heating of castings are introduced. Also some attention is given to welding of heavy steel. A. S. M. E. standard tensile tests are made on steel specimens welded in the horizontal position. Winter. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Kemp*

43, 43a. Acetylene Aluminum Welding. (Technical and Shop.) Training in the welding of aluminum, duraluminum, chrome-molybdenum, inconnel, stainless steel, miscellaneous alloys and non-ferrous metals with the oxy-acetylene and Heli-arc welding equipment. Some attention is also given to pipe welding, hard surfacing and flame hardening. A. S. M. E. standard tensile tests are made on steel specimens welded in the vertical and overhead position. Spring. Technical, five credits. Daily 9; Shop, five credits, Daily 10-1. *Kemp*

44, 44a. Electric Steel Welding. (Technical and Shop.) Training in fusion welding of mild steel by means of electric-arc welding equipment. Various techniques and welding positions are studied and practiced, and the A. S. M. E. standard tensile test is made on samples welded in flat position. Included in this course is a careful study of the equipment, and safety factors involved. Fall. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Wadsworth*

45, 45a. Electric Cast-Iron Welding. (Technical and Shop.) Training in fusion welding, bronze welding of cast-iron and malleable castings with electric-arc welding equipment. Special problems in preheating of castings and welding of heavy steel. A. S. M. E. standard tensile tests are made on steel specimens welded in the horizontal position. Winter. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Wadsworth*

46, 46a. Electric Aluminum Welding. (Technical and Shop.) Training in the welding of aluminum, duraluminum, chrome-molybdenum, inconnel, stainless steel, miscellaneous alloys and non-ferrous metals with the electric-arc welding equipment. Some attention is also given pipe welding and hard surfacing. A. S. M. E. standard tensile tests are made on steel specimens welded in the vertical and overhead positions. Spring. Technical, five credits, Daily 9; Shop, five credits, Daily 10-1. *Wadsworth*

91. Acetylene Welding. Principles and practice in the fundamentals of oxy-acetylene welding and cutting. A general course open to any college student. Three credits. Any quarter. Lecture, T. Th. 2; Lab., T. Th. 3-5. *Kemp and Wadsworth*

92. Aero Welding. Principles and practice in welding steel and alloy steel tubing as practiced in aircraft construction and repair. Some attention will be given to resistance welding. Three credits. Fall. Lecture, T. Th. 2; Lab., T. Th. 3-5. *Kemp*

94. Electric Welding. Principles and practice in the use of the latest types of electric-arc welding equipment. Safety measures and methods used in arc-welding of steels. Three credits. Any quarter. Lecture, M. W. 2; Lab., M. W. 3-5. *Kemp and Wadsworth*

96. Engineers Welding Laboratory. Exploration in modern welding. Students receive basic instruction and practice in the use of oxy-acetylene welding and cutting, electric-arc welding, and spot welding equipment. Two credits. Any quarter. T. Th. 8-11. *Kemp and Wadsworth*

190. Advanced Acetylene Welding. (Prerequisite: Welding 91.) Principles and practice in welding metallurgy pertaining to acetylene welding of mild steel, cast iron, bronze, aluminum, stainless steel, low carbon alloy steel, hard-surfacing and flame hardening. Laboratory welding in vertical and overhead positions, and testing welds by means of the tensil hardness, etching, and miscroscope. Three credits. Fall. Lecture, M. W. 8; Lab., M. W. 9-11. *Kemp*

191. Advanced Electric Welding. (Prerequisite: Welding 93.) Principles and practice in welding metallurgy pertaining to electric welding of mild steel, cast iron, bronze, aluminum, stainless steel, low carbon alloy steel, hardsurfacing and flame hardening. Laboratory welding in vertical and overhead position and testing welds by means of the tensil hardness, etching, and microscope. Three credits. Winter. Lecture, M. W. 8; Lab., M. W. 9-11. *Kemp*

193. Welding Seminar. (Prerequisites: Welding 190 and 191.) Current topics in production methods, cost, design, and manufacture of welded products as used in modern industry. Two credits. Spring. Lecture, M. W. 8; Lab., M. W. 9-11. *Kemp*

FORGE PRACTICE

FRANK OLSEN, *Instructor.*

The Forge Practice Unit of the Department of Metalwork and Mechanical Drawing provides general service courses for the various departments in the School of Engineering and Technology and for other departments on the Campus. These courses are in forging, bench metalwork, and ornamental iron work. They are open to any college student.

The Forging Laboratory is equipped with hand tools, shop equipment, and necessary materials for complete work in this field.

Forging is basic to the metal working trades and industries. Its fundamental operations are practiced in fabrication and construction work, maintenance and repair work, and in many forms of manufacturing. Students in Engineering, Technology, Agriculture, and many related fields will profit by basic training in forge practice.

Description of Courses

11. Forging and Bench Metal Work. (For Engineering and Agricultural students.) Fundamental operations of forging, such as shaping, bending, forge welding, hardening, and tempering. Use of tools and the fundamental bench operations. Two credits. Any quarter. T. Th. 9-12. *Olsen*

81, 82, 83. Forge Practice. Training in the fundamental operations of forging, such as shaping, bending, drilling, hardening, tempering and forge welding. This course will prepare the student to do successfully the forging jobs in repair shops, construction camps, and industrial maintenance shops. This training is necessary for all acetylene and electric welders and other metal workers entering present-day industries. Open to all college students. This course is especially helpful to students in Agriculture, Engineering, Technology and Forestry. Five credits each course. Part of these courses may be taken any one quarter: 81a, first two, or 81b, first three credits; and 81c, last three, or 81d, last two credits of the course. Any quarter. Daily 2-5. *Olsen*

84. Ornamental Iron Work. Designing and making of iron furnishings, fences, gates, frilles, pardinieres, sign brackets, etc. This course is particularly designed for students in Industrial Arts and Farm Mechanics. Prerequisite: Forging 81a. Two credits. Spring. M. W. F. 11-1. *Olsen*

MECHANICAL DRAWING

FREDERICK PREATOR, *Associate Professor;*
G. MERRILL SHAW, *Assistant Professor.*

The Mechanical Drawing unit of the Department of Metalwork and Mechanical Drawing, offers service courses in mechanical drawing, aircraft drawing and blueprint reading.

The drafting laboratory, with a floor space of 1,600 square feet is well lighted and equipped to handle a class of 40 students at individual drafting tables. Modern equipment such as Universal drafting machines, the different printing machines, and printing processes are made available to the students.

The mechanical drawing classes M. D. 91, 92, 93, are basic courses, offered as service courses to all departments. Special emphasis is put on fundamentals of good shop practices used on drawings common in industry.

91, 92, 93. Mechanical Drawing. The use of instruments and types of lettering on template drawings and graphic solutions; standard elements and symbols which make up mechanical drawings used in industry. The theory of shape and its representation in orthographic projections, sections, auxiliary views, revolutions, and size description. Isometric drawings and the translation of orthographic into pictorial drawings. Two credits each course. 91, Fall, T. Th. 10-12 or 2-5. Winter, M. W. F. 10-12. 92, Winter, T. Th. 10-12 or 2-5. Spring, M. W. F. 10-12. 93, Spring, T. Th. 10-12 or 2-5. *Shaw*

94. Working Drawings and Specifications. Completion of assembly drawings, detailed working drawings, scale drawings of building plans, and details showing parts of construction. Tracing and blueprinting. Three credits. Winter, M. W. F. 11-1. *Preator*

95. Machine Drafting. Problems pertaining to machinery drives and fastenings, mechanisms of power and motion, and the design of machine parts incorporating standardized methods consistent with industry. Three credits. Fall, M. W. F. 11-1. *Preator*

96. Aircraft Drawing and Blue Print Reading. Problems common to the aircraft industry are used. The special aircraft methods of representation, aircraft numbering systems, change methods, classes of prints and technical specifications are stressed. Prerequisites: M. D. 91, 92, 93. Three credits. Winter, M. W. F. 10-12. *Preator*

197. Aircraft Layout Drafting. Problems in laying out aircraft components from loft lines and/or tabulated data. This course is designed for students majoring in aeronautics. Prerequisite: M. D. 96 or equivalent. Three credits. Spring quarter. Time arranged. *Preator*

Radio and Electronics

S. R. STOCK, *Professor;* LARRY S. COLE, *Associate Professor;* ....., *Assistant Professor;* WILLIAM L. JONES, *Instructor.*

This Department offers a standard four-year curriculum leading to the Bachelor of Science Degree in Radio Technology. It is a technical institute type course, the objective of which is to provide a thorough fundamental technical education—both theory and practice—in the various phases of radio and electronics. Particular emphasis is given to the practical aspects of the work such as construction, operation, and maintenance.

The unusual growth and development in the fields of radio, communications, and electronics has created a constantly increasing demand for well-trained engineers, technicians, operators, and maintenance men. Graduates and former students of this Department have found excellent positions and opportunities. A record of past graduates shows employment in the following major fields: Radio Broadcasting—Engineers, and Operators; Civil Service—Radio Engineers and Technicians; Industrial—Radio Engineers, and Technicians; Radio Servicing—Technicians.

The Department of Radio maintains extensive contacts with industrial and governmental agencies that employ technically trained radio men, and gives employment assistance to students who have completed various phases of training.

The Radio Department has extensive laboratory space, modern equipment, and a well-trained staff. Included in the equipment available are such items as: radio transmitters from 25 to 1000 watts, both commercial and composite types; a large number of commercial communications receivers; a completely equipped broadcasting studio with all monitoring and recording equipment; complete radar and other UHF equipment; a comprehensive stock of radio testing and measuring equipment, and an excellent stock of radio parts and tubes for instructional and experimental purposes.

In addition to the regular B. S. Degree course, the Radio Department offers a one-year vocational technical type course in radio service and repair.

CURRICULUM

Degree: Bachelor of Science in Radio Technology

Freshman

Course	Credits F	W	S
Radio 23, 24, 25	3	3	3
Radio 31, 32, 33	1	1	1
Math 34, 35, 44	3	5	3
Chem. 10, 11	5	5	—
English 17, 18, 19	3	3	3
C. E. 61 or M. D. 91	2	—	—
Geol. 3	—	—	5
M. S. and T. 1, 2, 3	1	1	1
	18	18	18

Sophomore

Course	Credits F	W	S
Radio 80, 81, 82	5	5	4
Math 97, 98, 99	5	5	5
Physics 20, 21, 22	5	5	5
C. E. 81	3	—	—
M. W. 51b	—	2	—
Speech 81	—	—	3
M. S. and T. 4, 5, 6	1	1	1
	19	18	18

Junior

Course	Credits F	W	S
Radio 125, 126, 110	4	4	4
Radio 150, 151	—	2	2
Math 122	3	—	—
Physics 175, 176, 177	3	3	3
C. E. 197	4	—	—
B. A. 100	—	—	3
Econ. 51	—	5	—
Electives	3	3	3
	17	17	17

Senior

Course	Credits F	W	S
Radio 120, 129, 160	4	4	3
Radio 140, 141	—	4	4
Radio 152, 153	2	2	—
Radio 175, 176, 177	1	1	1
English 111	—	—	4
Electives	9	5	4
	16	16	16

Description of Courses

1, 2, and 3 constitute the one-year Vocational Industrial Course in Radio Maintenance and Repair.

1, 1a. Radio Circuits. (Technical and Shop.) Training covering radio, electricity, and circuits; use and care of radio tools and test instruments; testing for and repairing of ordinary troubles. Fall. Technical, five credits. Daily 10; Shop, four credits. Daily 2-5. *Staff*

2, 2a. Radio Receivers. (Technical and Shop.) A continuation of Radio 1 covering radio receiver circuits; testing, diagnosis, and repair of ordinary receivers. Winter. Technical, five credits, daily 10; Shop, four credits, Daily 2-5. *Staff*

3, 3a. Special Radio Receivers and Equipment. (Technical and Shop.) A continuation of Radio 1 and 2 covering the circuits, adjustment, and maintenance of high fidelity, all wave and F. M. receivers; sound systems, and other radio equipment. Spring. Technical, five credits, Daily 10; Shop, four credits, Daily 2-5. *Staff*

21. Fundamentals of Electricity. A course especially designed for students majoring in Industrial Arts, Automotive, Refrigeration, Welding, etc., covering basic principles of practical and applied electricity. Principles of Electricity; D. C. and A. C. circuits; power; wire and wiring; motor, generator, and transformer principles; batteries; electrical measurements. Four credits. Fall. M. T. W. Th. 8. *Staff*

23. Radio Electricity. Fundamentals of electricity; direct current circuits and circuit components; magnets and magnetism. Laboratory work covers soldering, wiring, use of diagrams and construction of several types of simple radio receivers. Three credits. Fall, T. Th. 9; Lab., W. 2-5. *Staff*

24. Radio Circuits. A continuation of Radio 23. Fundamentals of alternating currents. A. C. circuits and components. Introduction to vacuum tube principles and applications in radio equipment. Laboratory work includes wiring, diagrams and construction of superheterodyne receivers, power supplies, and amplifiers. Three credits. Winter, T. Th. 9; Lab., W. 2-5. *Staff*

25. Receivers and Transmitters. An introductory course covering the principles of radio communication systems, receivers, transmitters and antennas. Laboratory work covers the construction, operation and adjustment of the fundamental units. Three credits. Spring, T. Th. 9; Lab., W. 2-5. *Staff*

31, 32, 33. International Code Practice. These courses will train the beginner to send and receive correctly 15 to 20 words per minute. The actual speed attained will depend on individual ability. Required of all students majoring in Radio. One credit each quarter. Fall, Winter and Spring, M. W. F. 12. *Staff*

80. D. C. Circuits. Principles and applications of D. C. circuit analysis and resistive networks. Five credits. Fall, Daily 10. *Cole*

81. A. C. Circuits. Principles and applications of series and parallel A. C. circuits. Resonance and simple networks. Prerequisite: Radio 80. Five credits. Winter, Daily 10. *Cole*

82. Electron Tubes. The principles, characteristics and operation of electron tubes in radio and associated equipment. Laboratory work covers the measurements, adjustment and effects in vacuum tube circuits. Prerequisite: Radio 81. Four credits. Spring, M. W. F. 10; Lab., W. 2-5. *Cole*

88. Forest Service Radio and Telephone. A service course for students in Forestry. Proper methods of operation, installation, station procedure, and communication practice will be given. The laboratory work will be done in the field, using standard Forest Service radio and telephone equipment. Telephone operation, line construction, and methods of locating and repairing common phone troubles. The Forest Service office at Ogden is furnishing the necessary telephone and radio equipment for the course. Two credits. Spring. F. 1-5. *Staff*

110. Communication Circuits. Principles and characteristics of transmission lines, networks, matching sections and filters used in communication systems. Four credits. Prerequisite: Radio 81. Spring, M. T. W. Th. 9. *Cole*

120. Antennas. Fundamentals of radio antennas, radiation and wave propagation; adjustment and construction of all types of Marconi and Hertzian antennas; directional arrays; feeder lines and matching networks; antenna and field strength measurements. Prerequisite: Radio 110. Four credits. Fall. M. W. F. 11; Lab., W. 2-5. *Cole*

125. Audio Frequency Amplification. A course covering the principles, characteristics, and construction of resistance, impedance, and transformer coupled audio amplifiers; audio circuit constants and measurements; Class A, AB and B power amplifiers. Prerequisite: Radio 82. Four credits. Fall. M. W. F. 9; Lab., W. 2-5. *Cole*

126. Radio Frequency Amplification. Principles, characteristics, and construction of R. F. voltage and power amplifiers; neutralization and adjustments; modulation; R. F. circuit constants. Prerequisite: Radio 82. Four credits. Winter, M. W. F. 9; Lab., M. 2-5. *Cole*

129. Sound, Recording and Studio Techniques. Principles of acoustics; microphone and speaker characteristics; theater and outdoor sound systems; instantaneous recording; motion picture recording and reproduction; specialized audio amplifiers. Laboratory work consists of recording and studio procedure, sound system installations, and acoustic measurements. Prerequisite: Radio 125. Four credits. Winter. M. W. F. 11; Lab., W. 2-5. *Cole*

140, 141. UHF Techniques. Principles of production, transmission and reception in the UHF spectrum. Applications of UHF transmissions, such as FM, television, and special devices. Prerequisites: Radio 120, 126. Four credits each quarter. Winter, Spring. M. W. F. 10; Lab., 2-5. *Staff*

150, 151, 152, 153, 154. Advanced Laboratory Work. Advanced radio laboratory work in construction of equipment and communication units; measurements and laboratory techniques. For Junior and Senior students majoring in Radio. Two credits each quarter. Any quarter. Two Labs. per week. Time arranged. *Cole*

160. Industrial Electronics. The application of electronic methods and devices to the measurement, control and regulation of production and testing processes; servo mechanisms; R. F. heating. Prerequisites: Radio 125, 126. Three credits. Spring. T. Th. 10; Lab., W. 2-5. *Staff*

175, 176, 177. Radio Seminar. A weekly meeting of staff and upper division Radio majors. Reports and discussions on recent developments in the fields of communications and electronics. One credit each quarter. F. 1-3. *Staff*

Woodwork and Building Construction

D. A. SWENSON, *Professor Emeritus;* JOSEPH COULAM, WILLIAM E. MORTIMER, *Associate Professors;* CHARLES N. MERKLEY, *Assistant Professor;* ROSS A. NYMAN, *Instructor.*

The Woodwork Department occupies the center and south wing of the second floor of the Mechanic Arts Building, containing 5,418 square feet of floor space. In this space is housed machine room, bench room, stock room, finishing room, classroom and office.

The shops are well lighted, well equipped with woodworking machines, and accommodate approximately 35 students at one time.

This department offers work in joinery and millwork, building construction, estimating and contracting, pattern making, wood turning, wood finishing, home mechanics, and cabinet work. It provides the necessary courses for the Bachelor of Science degree in Woodwork and Building Construction; it provides for a two-year terminal course in Carpentry and Building Construction; and service courses that may be used toward satisfying the cirriculum in Industrial Arts.

CURRICULUM

Degree: Bachelor of Science in Woodwork and Building Construction

Freshman

Course	Credits F	W	S
English 17, 18, 19	3	3	3
Drawing 91, 92, 93	2	2	2
W. W. 6, 7, 8	3	3	3
W. W. 61, 62, 63	5	5	5
Radio 21	4	—	—
W. W. 68	—	3	—
W. W. 70	—	—	2
Electives	1	2	3
	18	18	18

Sophomore

Course	Credits F	W	S
Drawing 94	3	—	—
Math 35, 46	5	—	5
Art 22	—	3	—
W. W. 60	—	—	2
W. W. 64a, 65a, 66a	3	3	3
W. W. 64, 65, 66	5	5	5
W. W. 72, 73	—	2	3
A. C. & R. 62	—	2	—
Electives	2	3	—
	18	18	18

Junior

Course	Credits F	W	S
Physics 20, 22	5	—	5
Chem. 10	—	5	—
C. E. 81	3	—	—
For. 126	3	—	—
W. W. 161, 162, 163	5	5	5
Econ. 51	—	—	5
B. A. 100	—	3	—
Electives	2	5	3
	18	18	18

Senior

Course	Credits F	W	S
W. W. 171, 172	5	5	—
For. 130	—	—	4
Econ. 125	3	—	—
His. 135	—	—	5
C. E. 130	3	—	—
English 111	4	—	—
Zoo. 111	—	4	—
Electives	3	9	9
	18	18	18

Courses W. W. 61, 62, 63, 74, 171, 172, 173 may be completed by taking part of the course during one quarter and the other part during a later quarter. The letters A, B, C, D are used to designate the subdivision of these courses. Thus, A represents the first two credits of the course; B represents the first three credits; C, the last three credits, and D, the last two credits. The three-hour courses are offered 9-12 M. W. F. each quater, and the two-hour courses are offered 9-12 T. Th. each quarter.

Description of Courses

6, 7, 8. Shop Problems. Deals with shop mathematics, placing emphasis upon the use of fractions, decimals, the metric system, percentage, and ratio and proportion, showing their application in the solution of shop problems. Applied geometry problems developed for the shop students. Areas, volumes, speed relations, cutting speeds, thread and gear calculations, flooring, roofing, board measure, the use of the steel square, estimating and cost of materials, all find application. Three credits. Each quarter. Sec. 1, M. W. F. 8; Sec. 2, M. W. F. 1. *Coulam, Mortimer and Staff*

60. Elements of Plumbing. Includes plumbing specifications, codes, layouts, installations, inspections, cutting and fitting pipe, and repairs. Two credits. Fall and Spring. Lecture, T. Th. 9; Lab., Th. 10. *Merkley*

61, 62, 63. Joinery and Millwork. The necessary basic training for students preparing to enter the woodworking trades, and also for students who wish a knowledge of woodwork for their own needs. These courses include a thorough study in the proper use, care and sharpening of hand tools, machine processes, safety measures, machine operation, care and repair of machines, and sharpening of machine cutters. Assigned reading and application of mathematics to woodwork problems are integral parts of the course. Problems are also assigned in the form of projects in bench work and wood turning to give practice in the fundamentals of wood construction. Two, three or five credits. Each quarter. Daily 2-5. *Swenson and Nyman*

64a, 64, 65a, 65, 66a, 66. Building Construction. (Technical and Shop.) A study of laying out and building homes, farm buildings, garages, etc., particularly stressing carpenter work. Units include concrete forming, framing, roof framing, roofing, scaffolding, siding, exterior and interior trim, window and door work. Special attention is given to trade construction methods. Prerequisites: W. W. 61, 62 and 63. Technical, three credits, M. W. F. 1; Lab., five credits, Daily 2-5. Each quarter. *Merkley*

67. Woodwork for Engineers. Fundamental operations of woodworking. Includes the use, care and sharpening of hand tools and power woodworking equipment, shop safety, lumber grading and its use, reading and use of the steel square. Also wood construction in engineering. Two credits. Each quarter. M. W. F. 10-12; T. Th. 9-11. *Nyman*

68. House Wiring. Designed to meet the needs of students in building construction courses. Work covers the national electrical code and, where available, the local codes in effect in Utah communities. Training in this course prepares the student to choose materials, design the circuit, and inspect systems for electrical heat, light, and power in a home or small public building. Three credits. Winter, T. Th. 8; three hour lab. arranged. *Mortimer*

72. Concrete and Clay Products. The composition of concrete for various purposes, the use and placement of reinforcing agents; waterproofing, coloring, and stone imitations, etc. Composition of bricks, tile, etc., and their strength and thermal conductivity are also studied. A number of projects are built in the laboratory during the course. Two credits. Winter, Lecture T. 8; Lab., Th. 8-10. Extra lab. section to be arranged. *Merkley*

73. Materials of Industry. Wood and wood products, commercial veneered panels, roof coverings, wall boards, insulating materials, siding, composition panelings, glass products and other non-metal materials used in the building trades. Three credits. Spring, M. W. F. 12. *Coulam and Mortimer*

74. Home Service Course. Upkeep and general repairs in the home, such as frequently are needed on electrical, plumbing, and other home equipment. Woodwork repairs and furniture refinishing as well as fitting of window blinds and screens, calcimining and wallpaper cleaning will receive attention. Minor repairs to heating, ventilating and refrigeration equipment will also be considered. The course, designed for solving home problems and also for teaching this type of work in Junior and Senior high schools, is open to men and women students. Prerequisite: High School Physics or equivalent. Each quarter, two to five credits. Daily 9-12 or M. W. F. 9-12; T. Th. 9-12. *Swenson*

160, 160b. Pattern Making. Making of simple patterns to illustrate suitable materials for the work, care, and precision necessary in pattern work; also construction of patterns for use in the foundry; teaching the principles of shrinkage, etc. Prerequisites: W. W. 61, W. W. 160, two credits. Fall, T. Th. 9-12; W. W. 160b, three credits. Winter, M. W. F. 9-12. *Swenson*

161, 162, 163. Building Construction. Estimating and contracting. Construction and design for homes, farm buildings and apartments, considering porch work, stairways, dormers, special roofs, insulation and other special construction, specification writing, cost estimating, contracting methods, and drawing of special sections and details. Also a study of allowable loads. Problems in actual bidding on sets of plans are worked out by the student. Prerequisites: nine hours Drafting and W. W. 61, 62, 63. Five credits each quarter.* Fall, Lect. M. W. F. 11. Winter and Spring, Lect. M. W. F. 3; Lab., T. Th. 2-5. *Coulam*

70 or 170. Wood Finishing and House Decorating. Fine wood finishing such as natural finishes, French polishing, hand polishing, stains, paints, enamels, gun work, interior and exterior wood finishes, plaster paints, brick stains, stucco paints, etc. Wallpapers and calcimines are also considered. The student is required to do practice work in each type of finishing. Two credits. Each quarter. T. Th. 9-12. *Swenson and Mortimer*

171, 172, 173. Cabinet Work. The design and construction of furniture and cabinets, including a study of the woods suitable for furniture and cabinet building, wood turning, inlaying, wood carving, and types of wood finishing. Projects are built in fine furniture and cabinets, which include inlaying, overlaying, and carving. Prerequisites: W. W. 61, 62, and 63. Two, three or five credits. Each quarter, Daily 2-5. *Staff*

174. Art Woodwork. The decorative means that craftsmen employ to make their products appeal to the artistic taste. The following phases will be treated by lecture and demonstration and supplementary laboratory work: Art turning, chip carving, band saw shaping, scrolling, twisted turning, inlaying and overlaying. Consideration will also be given to decorative effects obtained by two-tone staining, bright colored stains and lacquers, burning and fine polishing. Prerequisites: W. W. 61 and 62a. Three credits. Fall, T. Th. 9-12. *Mortimer*

II. Industrial Education Program

ERNEST C. JEPPSEN, *Professor;* WILLIAM E. MORTIMER, *Associate Professor;*
C. D. MCBRIDE, EDWARD L. FRANCE, *Assistant Professors;*
BERT V. ALLEN, *Instructor.*

The Industrial Education Department offers a program of professional training for teachers, supervisors, and administrative staff in Industrial Education. This program continues throughout the regular school year and into the summer session. Students can complete their undergraduate work and receive a Bachelor of Science degree in Industrial Education by majoring in Industrial Arts Education or Trade and Industrial Education.

The Master of Science degree is offered in Industrial Education with majors in Industrial Arts Education or Trade and Industrial Education. The following courses in the 100 series may be used for graduate credit by majors in Industrial Education and by majors in closely related departments: I. E. 102, 104, 107, 109, 110, 111, 120, 121, 123, 124. Courses in the 200 series are intended only for graduate work. Registration in these courses requires the approval of the major professor and the instructor concerned: I. E. 251, 252, 253, 254, 255, 259, 260, 261, 262, 263, 264, 265, 266, 267, 271.

INDUSTRIAL ARTS EDUCATION

The curriculum in Industrial Arts is designed to meet state certification requirements for the General Secondary and Class A Industrial Arts certificates

*If the lab. has been satisfied for W.W. 161, three credits will be allowed for the lecture.

and is composed of courses in Arts and Sciences, Education, Industrial Arts Technical and Professional, and basic shop skills. The arts and science courses are described in the departments of the School of Arts and Sciences. The Education courses are provided jointly by the School of Education and the Division of Technology of the School of Engineering and Technology. The general education courses are described in the departments of the School of Education and the descriptions of the technical and professional Industrial Arts courses follow the curriculum in Industrial Arts. The courses in the basci shop skills are described in the departments of the Division of Technology, namely: Aeronautics, Air Conditioning and Refrigeration, Automotive, Metalwork and Mechanical Drawing, Radio and Electronics, Woodwork and Building Construction, and Industrial Education. The curriculum for the Bachelor of Science Degree in Industrial Arts is as follows:

Degree: Bachelor of Science in Industrial Education

Major: Industrial Arts

Minor: To be selected

Freshman

Course	Credits F	W	S
College Algebra 35	—	5	—
Prin. of Biology 1	5	—	—
Gen. Economics 51	—	—	5
Shop Drawing M. D. 91, 92, 93	2	2	2
PE or MS 1, 2, 3	1	1	1
El. Design and Form Study 1	—	3	—
Joinery & Millwork 61, 62	5	5	—
Machine Practice 51	—	—	5
Design & Its Application 2	—	—	3
Electives	3	—	—
	16	16	16

Sophomore

Course	Credits F	W	S
Intro. Physics 3	—	5	—
Soph. Comp. 10	5	—	—
El. Gen. Psy. 3	—	—	5
Plastics 42	2	—	—
PE or MS 4, 5, 6	1	1	1
Forge Practice 81a	—	2	—
Ornamental Iron 84	—	—	2
Gen. Physiology 4	—	5	—
Chemistry 1	5	—	—
Extempore Speech 5	3	—	—
Sheet Metal 40	—	—	2
Electives	—	3	6
	16	16	16

Junior

Course	Credits F	W	S
Prin. & Obj. of I.E. 107	3	—	—
Course of Study Bldg. 109	—	5	—
Ed. Psychology 102	5	—	—
Art Metalry (Jewelry) 113	2	—	—
Minor Crafts (Leather) 114	—	3	—
Adv. Comp. 110	—	4	—
Fund. of Electricity 21	4	—	—
Wood Finishing 170	—	2	—
Metal Finishing 162	—	—	2
Art Metal 141	—	—	2
Prin. of Soc. 70	—	—	5
Electives	2	2	7
	16	16	16

Senior

Course	Credits F	W	S
Methods in Ind. Ed. 121	3	—	—
Curric. Problems 123	—	6	—
School Health 155	—	3	—
Obs. & Dir. Teaching 112	—	—	8
Org. & Adm. of Ed. 114	—	3	—
Voc. Guidance Ed. 113	3	—	—
Shop Org. & Mgt. 110	—	—	3
Electives	10	4	5
	16	16	16

Description of Industrial Arts Courses

40. Sheet Metal. This course gives practice in the fundamental operations and tool processes of sheet metal work. Articles are made from black iron, galvanized iron, and bright tin that give practice in pattern developing, cutting, soldering, seaming, riveting, wiring, etc. The training needed for teaching sheet metal work in high schools will receive due consideration during the course. Two credits. Spring, T. Th. 2-5. *Mortimer*

42. Plastics. To acquaint students with the new and important group of plastics materials now being produced and to teach them the fundamental operations used in working these materials. Students will complete projects in hand and machine work that apply to the Industrial Arts program. Two credits. Fall, T. Th. 8-10. *Mortimer*

43. Recreational Crafts. A course designed especially for students majoring in recreational leaderhip. The work consists of two parts: (1) planning and organizing craft work as a part of community recreational programs, and (2) laboratory work in various craft fields, such as wood, leather, plastics, archery, metals, etc. One lecture and one lab. period per week. Two credits. Fall. Time arranged. *Mortimer*

112. Observation and Directed Teaching. To give students the opportunity of observation and directed teaching in Industrial Arts shops near the College. Each student will, under close supervision, practice teaching various Industrial Arts courses recommended by the state in both junior and senior high schools. Application for this course should be made one quarter in advance. Eight credits. Winter and Spring. Time arranged. *Mortimer*

113. Driver Education and Traffic Safety. This course is designed to acquaint prospective teachers and others with available instructional materials in the field of driver education and the latest methods of presenting such materials in the classroom and on the road. Supervised practice will be arranged for each student. Three credits. Spring, Lecture, T. Th. 8; Lab., Arranged. *Jeppsen and France*

123. Curriculum Problems in Industrial Arts. To teach prospective junior high school industrial arts instructors the application of the skills and knowledge they have acquired in their basic shop courses. Each prospective instructor will construct projects that are suited to the work recommended by the State Department of Education for junior high schools. They will also prepare the necessary lesson plans and teaching aids that will supplement and aid teachers in carrying out the program. Prerequisites: Basic shop courses in Wood, Drawing, Metal, Electricity, Crafts, and Course of Study Building. Six credits. Winter, Lecture, M. W. F. 2; Lab., Daily 3-5. *Mortimer*

141. Art Metalwork. This course consists of laboratory work in embossing, sinking, engraving, etching and metal spinning operations. The work is done in copper, brass, and aluminum on projects designed for utility and artistic merit. Prerequisites: Art 2, Machine Work 51b. Two credits. Spring, M. W. 2-5. *Mortimer.*

TRADE AND INDUSTRIAL EDUCATION

The curriculum in Trade and Industrial Education is designed primarily for instructors and supervisors in Vocational Technical Education and/or in Vocational Industrial Education Programs. A candidate for this degree must show evidence of at least five years successful trade experience and three years successful teaching experience, together with the general education requirements necessary for State certification in his field. The trade and teaching experience must be approved by a committee consisting of the Department Heads and Chairman of the Division of Technology.

CURRICULUM

Degree: Bachelor of Science in Industrial Education
Major: Trade and Industrial Education
Minor: To be selected

A. 60 credits Trade training or equivalent
B. 40 credits General group requirements
C. 30 credits Education and psychology (upper division)
D. 20 credits Technician training (upper division)
E. 36 credits Recommended electives (including Eng. 111 and MS or PE)

186 Total credit hours

Description of Industrial Education Courses

21. Trade Problems. Trade orientation, labor problems, and human relations affecting vocational students and apprentices. Designed especially for students graduating from the Vocational Technical Program. Three credits. Spring. M. W. F. 1. *Jeppsen*

102. Instructional Aids. Instruction in the purpose, types, sources, preparation and proper use of audio and visual aids for classroom instruction. The units of this course include samples, models, charts, graphs, slides, still film, movie film, sound film, stereoptican projection, recording, sound systems, and other aids suitable for classroom and auditorium use. Three credits. Quarter and time arranged. *Jeppsen*

104, 204. Occupational Analysis. Principles and practice in analyzing occupations for the purpose of determining teaching content. Students will complete an analysis of one unit of a trade or occupation. Three credits. Quarter and time arranged. *Staff*

107, 207. Principles and Objectives of Industrial Education. To acquaint students with the general philosophy and purposes of Industrial Education, and to enable them to understand and appreciate its place in the modern educational program. Students will study and compare the general principles and objectives of Industrial Arts Education and Trade and Industrial Education with those of other educational programs. Three credits. Fall, M. W. F. 8. *Jeppsen and Mortimer*

109, 209. Course of Study Building in Industrial Education. To teach students to prepare and use a course of study consisting of the outline, analysis, progress charts, lesson plans, instruction sheets, references, tests, and instructional schedule. Each student will complete this work for one unit of instruction. Five credits. Winter, Daily 8. *Jeppsen*

110, 210. Shop Organization and Management. To teach students to organize and manage an Industrial Education shop of the unit, general, or comprehensive type. Each student will prepare for one type of shop, a complete plan of organization and management dealing with the necessary equipment, materials, supplies, methods of purchasing, financial control, and problems of shop arrangement. Three credits. Spring. Time arranged. *Mortimer*

111. The General Shop. This course consists of a comprehensive study of the "General Shop" type of organization; its advantages and limitations; the content and organization of subject matter applicable to this type of organization, together with suitable methods for presenting subject matter. Class control and the trends of the program will also be given consideration. Prerequisite: I. E. 107. Three credits. Quarter and time arranged. *Staff*

120. Personnel Relations. Problems of handling people, management, and safety as they affect employers and employees. Students will present, analyze, and work out solutions to each of these types of problems. Three credits. Any quarter. Time arranged. *McBride*

121, 221. Methods in Industrial Education. To teach students the latest methods and techniques of teaching as applied to individual and group instruction in the fields of Industrial Education. Each student will have the opportunity of using these different methods in presenting lessons before the class. Three credits. Fall, M. W. F. 10. *Jeppsen*

124, 224. History of Industrial Education. This course deals with the historical developments of manual and industrial education from the early leaders—Socrates, Plato, Rousseau, Pestalozzi, Froebel, etc.—to the present time. Emphasis is given to the influence that the various leaders and movements, both in Europe and America, have had upon present day objectives of industrial arts and vocational industrial education. Three credits. Quarter and time arranged. *Staff*

251. Administration of Industrial Education. The laws, regulations and policies affecting Industrial Education Programs; organization and management necessary for the successful operation of these programs; and pertinent problems and their solutions. Students will prepare a plan of administration suitable to their school or district. Three credits. Quarter and time arranged. *Staff*

252. Supervision of Industrial Education. Latest methods in supervision of Industrial Arts Education and Trade and Industrial Education. Designed for administrators, supervisors, and teachers in service who are responsible for the improvement of industrial arts and vocational education through supervision, or for students who wish to prepare for supervisory work; special attention to supervision of all-day, part-time, and evening programs of industrial arts and vocational education. Students will prepare a plan of supervision suitable to their situation. Three credits. Quarter and time arranged. *Staff*

253. Coordination in Industrial Education. This course deals with the functions of coordinators in their relationship to the administration and supervision of industrial education programs. The responsibilities and duties of coordinators will be outlined and emphasis will be given the procedures most successful in the performance of these duties. Three credits. Quarter and time arranged. *Staff*

254. Measurements in Industrial Education. A study of the construction and use of the various types of tests and rating scales used in industrial education. Emphasis will be placed upon measurable factors in industrial education and the types of tests best suited to this field. The elements of statistical methods that are necessary for an intelligent use of the tests are given as part of the course. Prerequisites: El. Psy. 102. Three credits. Quarter and time arranged. *Mortimer*

255. Techniques in Writing Instruction Sheets. A study of the basic principles underlying the development of instruction sheets that can be used in industrial arts and trade and industrial education programs. Three credits. Quarter and time arranged. *Staff*

259. Planning and Equipping Industrial Education Buildings. Principles and practice in planning and equipping modern industrial arts laboratories and trade and industrial shops. This course is designed for administrators, supervisors, directors, architects, and others interested in planning new or remodeling existing facilities. Students will study the basic plans of laboratory or shop design and arrangement of equipment, and will apply these principles to the solution of their own particular problems. Three credits. Quarter and time arranged. *Staff*

260. Diversified Occupations. The content, methods, and special devices to be used in the teaching of Diversified Occupations. Emphasis is placed upon pertinent problems and their solutions. Students will prepare a syllabus covering the essential materials for one unit of instruction in Diversified Occupations. Three credits. Quarter and time arranged. *Staff*

261. Part Time Education. The content, methods, and special devices to be used in Part Time Education programs. Emphasis is placed upon pertinent problems and their solutions. Students will prepare a syllabus covering the essential materials for a course in Part Time Education. Three credits. Quarter and time arranged. *Staff*

262. Supervisory Personnel Development Institute. This is an institute for the training of conference leaders, supervisors, and administrative personnel in the methods and techniques of presenting conferences, and personnel training. Three credits. Quarter and time arranged. *Staff*

263. Evening School Programs. Development, organization and improvement of evening school programs in Industrial Education. Students wll prepare a syllabus covering the essential materials needed for such a program. Three credits. Quarter and time arranged. *Staff*

264. Conference Leading. Principles and practice in conference leading as it applies to the methods used in industry. Emphasis will be given to the preparation, use, and evaluation of this method as it affects Industrial Education Programs. Three credits. Quarter and time arranged. *Staff*

265. Apprenticeship. Development, organization, and improvement of apprentice training programs for industry. Students will prepare a syllabus covering the essential materials needed for such a program. Three credits. Quarter and time arranged. *Staff*

266. Related Instruction. The content, methods, and special devices to be used in the teaching of related subjects in Vocational programs. Emphasis is placed upon pertinent problems and their solutions. Students will prepare a syllabus covering the essential materials for one unit of Related Instruction. Three credits. Quarter and time arranged. *Staff*

267. Reading and Conference. A course providing for study in advanced and specialized problems in Industrial Education. Problems are selected with the approval of the department head, investigation being carried on under the direction of the major professor. Credit, quarter, and time arranged. *Staff*

271. Research and Thesis Writing. This course privides for individual work in thesis writing in Industrial Education. The thesis is to be written in accordance with standard thesis requirements and under the direction of the major professor. Credit, quarter, and time arranged. *Staff*

Note: In an effort to be of maximum service to the Industrial Education teachers and supervisors in this Intermountain Region in keeping them current with the national picture in Industrial Education, the Industrial Education Department has organized special courses primarily for these teachers in service as they attend Summer Session to do graduate work. The notation "quarter, time and staff arranged" is made for the specific purpose of bringing in as visiting staff, noted leaders for these courses as the situation demands.

COMMERCIAL PHOTOGRAPHY

BERT V. ALLEN, *Instructor.*

At present the new but fast-growing unit of Commercial Photography is part of the Industrial Education Department. This unit offers special opportunities for students in this field. General service courses are available to any college student desiring instruction in the fundamentals of Photography. A special two-year program is available for students wishing to prepare themselves as commercial photographers. Students working toward a Bachelor of Science Degree in Agriculture, Engineering, Forestry, Technology and many other speciailized fields will find these courses extremely helpful in supplementing their major.

Photography is comparatively new, but offers many opportunities for those who are prepared. Business, Industry and Agriculture; Schools, Professions, and Science—these and many more are fertile fields for commercial photographers and photographic technicians. Potography can be thought of as the extension of natural capacities. It is difficult to name a single branch of human activity in which photography does not play an important part.

Description of Courses

51. General Photography. Principles and practice in the fundamentals of general photography. Training will be given in the selection and use of cameras, lenses, meters, films, filters, lights, developers, and accessories. Three credits. Any quarter. Lecture, T. Th. 1; Lab., M. W. F. 1. *Allen*

61, 61a. Introductory Photography. Training in taking still pictures. The units include selection of materials; exposing and developing of films; contact printing; enlarging; and trimming and mounting of prints. This is the first of a series of six units in commercial photography having as their objective the preparation of technicians in this field. Any quarter. Technical, four credits, M. T. W. Th. 9; Lab., four credits, M. T. W. Th. 10-12, F. 9-12. *Allen*

62, 62a. Industrial Photography. Training in news, architectural, and machine photography. The units include photoflash, interior lighting, action and news, still life, table top, fashion, building, machine, and aerial photography applied to this field. Blocking, photomontage, and airbrush work also are included. Winter. Technical, four credits, M. T. W. Th. 9; Lab., four credits, M. T. W. Th. 10-12, F. 9-12. *Allen*

63, 63a. Agricultural Photography. Training in all types of agricultural, stock, and poultry photography. The units include landscape, garden, flower and plant, livestock, poultry, and farm photography. Also aerial photography applied to this field. Spring. Technical, four credits, M. T. W. Th. 9; Lab., four credits, M. T. W. Th. 10-12, F. 9-12. *Allen*

64, 64a. Motion Picture Photography. Training in the care and use of 8mm. and 16mm. motion picture equipment and materials. The units include motion picture equipment, films and filters, composition, exposure, lighting, editing and projection. Fall. Technical, four credits, M. T. W. Th. 9; Lab., four credits, M. T. W. Th. 10-12, F. 9-12. *Allen*

65, 65a. Protrait Photography. Training in portrait and group photography. The units include model directing, lighting, posing, head and shoulder, three quarter, full length, and group photography. Considerable emphasis will be placed upon child and home portraiture. Winter. Technical, four credits, M. T. W. Th. 9; Lab., four credits, M. T. W. Th. 10-12, F. 9-12. *Allen*

66, 66a. Color Photography. Training in the use of color cameras, films, filters, and printing processes. The units include introduction, outline and glossary, kodachrome, kodacolor and printing by imbibition, pigment, and toning. Also aerial photography applied to this field. Spring. Technical, four credits, M. T. W. Th. 9-12; Lab., M. T. W. Th. 10-12, F. 9-12. *Allen*

151. Photographic Problems. Special problems in advanced photography. This course is designed to meet the needs of individual students in solving advanced photographic problems. Three credits. Any quarter. Time arranged. *Allen*

III. Vocational Technical Program

Cooperating with the Federal and State Departments of Education, the Division of Technology offers in the Vocational Technical program, specialized training in ten major fields. This program offers technical training in the practices of industry with latest methods, modern equipment, and live and productive work. The instructors are men with years of successful trade experience and carry with them the full respect of their trade. Each curriculum provides for technical instruction one hour daily, shop practice in the laboratory three hours daily, general related information one hour daily, and electives one hour daily.

Close cooperation is maintained between the school and industry with problems of training and placing of students considered jointly with advisory committees. Students satisfactorily completing the two-year training program are awarded a Technical Certificate and are prepared to enter the industry as a mechanic helper or as an advanced apprentice. The Technical Certificate may be earned in any of these curricula without having satisfied college entrance requirements, but credit thus earned cannot be applied toward the requirements for the degree. Further description of these courses will be found in the departments where they are listed.

The Vocational Technical Program on this campus offers many distinct advantages to those students desiring terminal education. Students graduating from this program are not only well prepared with the skills of their trade to enter modern industry, but they are equally well prepared through their association and activities on a college campus to take their place in society. Students entering industry from this training program have opportunities for further progress and advancement through industry itself as has been demonstrated by many industrial leaders in this nation, or by returning to this institution for further preparation for supervisory and managerial positions.

The Division of Technology, as an integral part of a Land-Grant College of Agriculture and Mechanic Arts, has and is pioneering in this field in its desire to provide types of training specified in the charter of Land-Grant colleges and universities.

Acetylene and Electric Welding

(Type A Unit Day Trade)

First Year:	F	W	S	Second Year:	F	W	S
Tech, Welding 41, 42, 43	5	5	5	Tech, Welding 44, 45, 46	5	5	5
Shop, Welding 41a, 42a, 43a	5	5	5	Shop, Welding 44a, 45a, 46a	5	5	5
Related, W. W. 6, 7, 8	3	3	3	Related, English 17, 18, 19	3	3	3
Forging 81a	2	—	—	MD 91, 92; IE 21	2	2	3
M. W. 51a, 50	—	2	3	Electives	3	3	2
Electives	3	3	2		—	—	—
	—	—	—		18	18	18
	18	18	18				

Aircraft and Engine Mechanics

(Type A Unit Day Trade)

First Year:	F	W	S	Second Year:	F	W	S
Tech, Aero 5, 6, 7	5	5	5	Tech, Aero 8, 9, 10	5	5	5
Shop, Aero 5a, 6a, 7a	5	5	5	Shop, Aero 8a, 9a, 10a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, Eng. 17, 18, 19	3	3	3
RA 21, MW 51b	4	3	—	M.D. 91, 92	2	2	—
Welding 92, 93	—	3	3	I.E. 21	—	—	3
Electives	1	—	2	Electives	3	3	2
	—	—	—		—	—	—
	18	19	18		18	18	18

Auto Body and Paint Reconditioning

(Type A Unit Day Trade)

First Year:	F	W	S	Second Year:	F	W	S
Tech, Auto 12, 13, 15	5	5	5	Tech, Auto 1, 2, 3	5	5	5
Shop, Auto 12a, 13a, 15a	5	5	5	Shop, Auto 1a, 2a, 3a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, Engish 17, 18, 19	3	3	3
Welding 91, 93	3	3	—	M.D. 91, 92	2	2	—
M.W. 51a	—	—	2	I.E. 21	—	—	3
Electives	2	2	3	Electives	3	3	2
	—	—	—		—	—	—
	18	18	18		18	18	18

Automotive Repair

(Type A Unit Day Trade)

First Year:	F	W	S	Second Year:	F	W	S
Tech, Auto 1, 2, 3	5	5	5	Tech, Auto 4, 5, 6	5	5	5
Shop, Auto 1a, 2a, 3a	5	5	5	Shop, Auto 4a, 5a, 6a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, English 17, 18, 19	3	3	3
M.W. 51b	3	—	—	M.D. 91, 92	2	2	—
Weld. 91, RA 21	—	3	4	I.E. 21	—	—	3
Electives	2	2	1	Electives	3	3	2
	18	18	18		18	18	18

Carpentry

(Type A General Industrial)

First Year:	F	W	S	Second Year:	F	W	S
Tech, R.A. 21, W.W. 68, 73	4	3	3	Tech, W.W. 64a, 65a, 66a	3	3	3
W.W. 70, A.C.&R. 62	2	2	—	W.W. 60, 72, 171a	2	2	2
Forging 81a	—	—	2	Shop, W.W. 64, 65, 66	5	5	5
Shop, W.W. 61, 62, 63	5	5	5	Related, English 17, 18, 19	3	3	3
Related, W.W. 6, 7, 8	3	3	3	M.W. 94, Art 22	3	3	—
M.D. 91, 92, 93	2	2	2	I.E. 21	—	—	3
Electives	2	3	3	Electives	2	2	2
	18	18	18		18	18	18

Commercial Photography

(Type B Unit Day Trade)

First Year:	F	W	S	Second Year:	F	W	S
Tech, C.P. 61, 62, 63	4	4	4	Tech, C.P. 64, 65, 66	4	4	4
Lab., C.P. 61a, 62a, 63a	4	4	4	Lab., C.P. 64a, 65a, 66a	4	4	4
Related, W.W. 6, 7, 8	3	3	3	Related, Chem. 1, B.A. 63	5	3	—
English 17, 18, 19	3	3	3	B.A. 100	—	—	3
Electives	2	2	2	M.D. 91, I.E. 21	—	2	3
	—	—	—	Electives	3	3	2
	16	16	16		—	—	—
					16	16	16

Diesel and Heavy Duty Mechanics

(Type A Unit Day Trade)

First Year:	F	W	S	Second Year:	F	W	S
Tech, Auto 21, 22, 23	5	5	5	Tech, Auto 4, 5, 6	5	5	5
Shop, Auto 21a, 22a, 23a	5	5	5	Shop, Auto 4a, 5a, 6a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, English 17, 18, 19	3	3	3
Forging 81a	2	—	—	M.D. 91, 92	2	2	—
M.W.51a,Weld.91	—	2	3	I.E. 21	—	—	3
Electives	3	3	2	Electives	3	3	2
	18	18	18		18	18	18

Machine Shop Practice

(Type A General Industrial)

First Year:	F	W	S
Tech, Aero 8, Auto 2, M.W. 50	5	5	3
Shop, M.W. 51, 52, 53	5	5	5
Forging 81a, 81c, 82b	2	3	3
Related, W.W. 6, 7, 8	3	3	3
M.D. 91, 92, 93	2	2	2
	17	18	16

Second Year:	F	W	S
Tech, M.D.95,96, M.W.181b	3	3	3
Shop, M.W. 151, 152, 153	5	5	5
Welding 91, 191	3	3	—
W.W. 160b	—	—	3
Related, English 17, 18, 19	3	3	3
I.E. 21	—	—	3
Electives	2	2	—
	16	16	17

Radio Service and Repair

(Type A Unit Day Trade)

First Year:	F	W	S
Tech., Radio 1, 2, 3	5	5	5
Shop, Radio 1a, 2a, 3a	4	4	4
Related, W.W. 6, 7, 8	—	3	3
M.D. 91, 92; I.E. 21	2	2	2
Electives	2	2	2
	16	16	17

Refrigeration and Air Conditioning

(Type A Unit Day Trade)

First Year:	F	W	S
Tech, A.C. & R. 1, 2, 11	5	5	5
Shop, A.C. & R. 1a, 2a, 11a	5	5	5
Related, W.W. 6, 7, 8	3	3	3
RA 21, MD 91, 92	4	2	2
Electives	1	3	3
	18	18	18

Second Year:	F	W	S
Tech, A.C. & R. 12, 21, 22	5	5	5
Shop, A.C.&R. 12a, 21a, 22a	5	5	5
Related, English 17, 18, 19	3	3	3
M.D.93;A.C.&R.61	2	2	—
I.E. 21	—	—	3
Electives	3	3	2
	18	18	18

SCHOOL OF FOREST, RANGE, AND WILDLIFE MANAGEMENT

LEWIS M. TURNER, *Dean.*

General Information

THE favorable geographical location of this School of Forest, Range, and Wildlife Management, the opportunity for self help for qualified men and great need for better management of the forest, range and game, provide an excellent combination of circumstances and opportunities for proper training in the management of wild lands and their resources.

Naturally-vegetated lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest, within two miles of school, the Bear River Migratory Bird Refuge within 40 miles, vast areas of range lands providing both grazing and soil conservation problems; all offer study projects and opportunities for demonstration. Herds of elk and deer come within a short distance of the campus during the winter.

The Wildlife Management department is greatly enhanced through the establishment of a research agency of the U. S. Fish and Wildlife Service on the campus, which is housed in the forestry building. One of the ten Federal Wildlife Research Units, a cooperative project with the college, the Utah Fish and Game Department, the U. S. Fish and Wildlife Service, and the American Wildlife Institute are located here under the leadership of Dr. J. B. Low. Representatives of this agency assist in class and laboratory instruction, and aid in directing the research of graduate students. Graduate fellowships in Wildlife Management have been made available through the Wildlife Research Unit.

The comparative newness of the fields of forestry, range, wildlife, soil conservation and forest recreation, and the unquestioned need for their correlation in permanent wild land management, present excellent opportunities for those desiring to participate in these fields of public service. The purpose stressed is the handling of wild lands so that they may be of continuing benefit for the present and future generations of citizens.

For more detailed information, request the current course of study of the School of Forest, Range, and Wildlife Management.

RECOMMENDED ENTRANCE QUALIFICATIONS

Students entering the School of Forest, Range, and Wildlife Management will make more satisfactory progress if they have had high school algebra, chemistry, physics, typing, biology, and geometry. If the student, for example, has not had high school algebra, he will be required to make up that deficiency in college. It is, therefore, recommended that these basic mathematics and science courses be taken in high school.

COURSES OF STUDY

The curriculum of this school is designed to train men for private, federal government or state work in (1) Forest Management, (2) Range Management, and (3) Wildlife Management. The Range majors may choose, in the senior year, to specialize either in Range Management or Soil Conservation.

FIVE-YEAR COURSE RECOMMENDED

The efficient management of wild land resources in all its phases requires a broad fundamental knowledge of many of the sciences and arts. For this reason, many of the forest schools throughout the nation have recognized that the usual four-year program of study is inadequate to give the student sufficient training in both the basic sciences and in the technical subjects of the chosen field. It is therefore recommended that a five-year course of study be pursued.

The first two years of the regular four-year course of study are practically the same in all departments, with specialization in a major field beginning in the third or junior year. This program gives the student only a minimum of basic training and cultural foundation. The five-year program would provide for an additional year devoted principally to general training in supporting arts and sciences. This would furnish a better foundation for the technical studies of the last two years and a superior cultural background which is so necessary for advancement in public service fields.

SUMMER CAMP

The School of Forest, Range, and Wildlife Management has purchased and leased 3,000 acres of forest and range land approximately 22 miles from the campus within the Cache National Forest, where summer camp facilities have been established. Field instruction is required for graduate in addition to the regular 12 quarters of course work. Also, at least one summer season of field experience with a recognized conservation agency is expected of all students.

Field instruction courses in Forestry, Range, and Wildlife given at summer camp, include: Forestry 90, Forestry 96, Forestry 97, Range 98, Wildlife 99, for a total of 15 credits. Attendance at this camp is required between the sophomore and junior years The summer camp opens on the second Monday, following the close of the spring quarter and continues for a period of 11 weeks. Fifteen credits are allowed for the complete course. In addition to the regular Summer School fees, a $5.00 fee is charged for each of the five courses, and board is provided on a cost basis. All junior college students planning on entering this school at the beginning of their junior year, should make arrangements to attend the camp during the summer following their graduation from the junior college. In the future successful completion of the Summer Camp courses will be prerequisite to all of the professional course work of the junior year.

FIELD TRIPS

A schedule of field trips is planned each year as a part of the regular class instruction. Courses requiring attendance on field trips are so designated under course descriptions. Charges for transportation are levied at the rate of one cent per mile. The total expense on this account varies between $1 and $5 during any one quarter.

In addition to the trips scheduled for the individual courses, each department conducts an extensive field trip in the spring quarter, covering all available branches of the major field. This trip is required of all seniors prior to graduation. The trip for wildlife majors is usually scheduled over the first week of May, and Range majors over the second week. The trip for Forestry majors is more extensive and covers a period of ten days or two weeks just prior to the end of the spring quarter.

SCHOLARSHIP

A high standard of scholarship must be maintained by the student interested in Forestry or the associated fields because of the technical nature of the work and the high professional standards and the character of the Civil Service examinations that are required for federal service. A student is required to maintain a C or better average to remain in the school.

MINORS

Students other than Forest, Range and Wildlife Management School majors may complete a minor in any of the three departments of the School upon completion of 18 credit hours approved by the head of the department concerned.

GENERAL REQUIREMENTS

The following general requirements must be met by all students graduating from the School of Forest, Range and Wildlife Management.

A. At least 207 credits (quarter hours) exclusive of basic Military Science and Physical Education.

B. Fifteen of the 207 credits must be earned at Summer Camp.

C. All courses prescribed under the study program of the chasen major.

D. All of the following general requirements:

1. English and Speech, 16 credits, of which at least 3 must be Speech.
2. Social Science—8 credits.
3. Military Science or Physical Education—6 quarters.[1]

BASIC COURSES

Required of all students majoring in the School of Forest, Range and Wildlife Management.

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
English 17, 18, 19	3	3	3	Civ. Eng. 81, 82, 83	3	3	3
Math. 34[2], 35, 46	3	5	5	Botany 30	—	—	5
Botany 21, 22, 23	3	3	3	Speech 5	—	3	—
Forestry 1	3	—	—	Economics 51	5	—	—
Civil Eng. 60	—	1	—	Physics 6	—	5	—
Mil. Sci.[1]	1	1	1	Agron. 58[3]	5	—	—
				Geo. 3	5	—	—
				Bot. 120	—	—	[4]5
				Mil. Sci.	1	1	1

Forest Management

LEWIS M. TURNER, J. W. FLOYD, T. W. DANIEL, *Professors;* C. M. BOWEN, *Associate Professor;* R. R. MOORE, *Assistant Professor.*

Upon completion of the curriculum prescribed below, students are granted the degree of Bachelor of Science, major in Forest Management. This course is designed to give the student a comprehensive background of all branches of forestry, including growing, protecting, harvesting and utilizing of timber crops. Related uses of forest land for grazing, wildlife and recreation are also presented to train the student properly in multiple use land management.

Electives: Electives necessary to fill out the program of the Sophomore year should be chosen with the object of improving the students' cultural as well as professional background. In the Junior and Senior years electives should be chosen with the object of broadening a specific field of study. Courses selected must meet the approval of the major professor.

Upon completion of a prescribed course and fulfillment of other requirements listed by the Graduate School, the degree of Master of Science in Forest Management will be given. One to two years may be required depending upon the ability of the student, the adequacy of his background, and his thesis problem. Students will be accepted for candidacy for a degree only if they already have the Bachelor of Science degree in Forest Management.

Several teaching assistantships are available to graduate students in Forest Management.

[1]Not required of ex-military service personnel.

[2]Students presenting 1½ units of High School Algebra are not required to take Math. 34.

[3]Students in Wildlife Management may elect Zoo. 3 in place of Agron. 58 in the Fall quarter and elect Zoo. in the Winter quarter. Agron. 58 may be taken in the Fall quarter of the Senior year.

[4]For Forest Management students only.

COURSE OF STUDY

Freshman and Sophomore Years—See Basic Courses.

Junior

Course	Dept.	Number F	Number W	Number S	Credit F	Credit W	Credit S
Fire Protection	For.	118	—	—	3	—	—
Forest Measurements I, II	For.	—	106	107	—	4	4
Dendrology	For.	112	—	—	4	—	—
Silviculture I, II	For.	—	114	115	—	3	3
Logging	For.	125	—	—	3	—	—
Plant Ecology	Range	126	—	—	5	—	—
Range Forage	Range	—	176	—	—	4	—
Plant Pathology	Botany	—	140	—	—	4	—
General Wildlife Management	Wildlife	—	—	150	—	—	5
Animal Husbandry	An. Hus.	—	—	1	—	—	4

Senior

Course	Dept.	Number F	Number W	Number S	Credit F	Credit W	Credit S
Wood Technology	For.	126	—	—	3	—	—
Forest Management	For.	121	—	—	4	—	—
Improvements and Recreation	For.	—	—	137	—	—	3
Seminar I, II, III	For.	142	143	144	1	1	1
Public Land Administration	For.	—	132	—	—	3	—
Forest Policy and Economics	For.	—	133	—	—	3	—
Forest Finance	For.	—	122	—	—	4	—
Milling and Products	For.	—	—	130	—	—	4
Forest Entomology	Zoo.	105	—	—	3	—	—
Range Management	Range	162	—	—	5	—	—
Range Seminar	Range	192	—	194	1	—	1
Vegetation Influences	Range	—	182	—	—	3	—
Economic Wildlife	Wildlife	—	155	—	—	3	—
Technical Writing	English	—	—	111	—	—	4

1. General Forestry. A general survey of the profession of forest management, range management, soil conservation, recreation and wildlife management; character of the work; and relation of multiple uses of wild land to the welfare of the state and the nation. Three credits. Fall, M. W. F. 10. *Turner*

10. Forest and Range Conservation. An introduction to conservation problems designed to acquaint students with the nature and extent of the organic resources of the United States and methods of conserving them. Forestry, soil conservation, range management and wildlife aspects are considered. Not open to School of Forestry majors. Two credits. Winter, T. Th. 10. *Floyd*

11. Winter Woodcraft. Lectures and field trips are designed to train the student in the proper way of living in the wilderness. Proper clothing, camping accessories, tents and emergency shelters, food lists and emergency foods, fires, nature lore, snow characteristics and weather signs are the principal topics studied. The student will use skiis and snowshoes. Prerequisite: ability to ski. The student must furnish ski boots and suitable outdoor clothing. Two credits. Winter. Lecture, F. 12; Field trips, S. 8-12. *Staff*

90. Forest Improvements. Practical field problems in trail and telephone construction, the use of field radios, methods of fire prevention, detection and suppression. Care and use of woods tools and horses in Forest, Range and Wildlife work. Problems in construction, planning recreational areas and water development. Interpretation of forest and range soils. Three credits. Summer Camp. Lab. fee $5.00. *Floyd and Turner*

96. Forest Surveying. Practical field problems in surveying methods commonly employed in Forest, Range and Wildlife Management. Type mapping. Three credits. Summer Camp. Lab. fee $5.00. *Floyd and Daniel*

97. Forest Practice. Study of timber types and successional stages. Timber cruising, log scaling, inventories and growth of immature stands; stem analysis, taper measurements, sample plots, milling and utilization studies. Three credits. Summer Camp. Lab. fee $5.00. *Bowen or Daniel*

101. Forest Survey I. Identification and range of the major commercial species of the United States. Elementary principles of silviculture and forest management. Not open to students in Forest Management. Three credits. Fall. T. Th. 8; Lab., Th. 2-5. *Daniel*

102. Forest Survey II. Forest improvement and recreation; log scaling, timber cruising, study of growth and yield; logging, milling, and seasoning of lumber. Some attention will also be given to identification, properties and uses of the major commercial woods of the United States and to the major wood products. Not open to students in Forest Management. Three credits. Winter. T. Th. 8; Lab., Th. 2-5. *Bowen*

106. Forest Measurements I. Measurements of timber in the log, the tree, and the stand. Log rules and volume tables. Timber cruising practices. Prerequisite, summer camp. Four credits. Winter, M. W. F. 11; Lab., F. 2-5. *Bowen*

107. Forest Measurements II. Statistical methods useful in analyzing forest data. Volume and yield table compilation. Growth of even-aged, all-aged, and residual cut over stands. Prerequisite, For. 106. Four credits. Spring, M. W. 10; Lab., T. Th. 2-5. *Bowen*

112. Dendrology. Identification and distribution of the more important forest trees of the United States. Three credits. Fall, M. W. 10; Lab., W. F. 2-5. *Daniel*

114. Silviculture I. Characteristics of the tree species which infleunce the silviculture practice in the United States. Prerequisites: Range 126 and Botany 120. Three credits. Winter, M. W. 9; Lab., T. 2-5. *Daniel*

115. Silviculture II. Silvicultural systems used in securing natural reproduction of forests and their applications to the important species and forest types in the United States. Prerequisite: For. 114. Three credits. Spring, T. Th. 10; Lab., W. 2-5. *Daniel*

116. Seeding and Planting. Seed collection, extraction and cleaning methods; germination testing; storage of forest tree seeds. Practical experience in field planting and nursery work. Two credits. Spring, T. 8; Lab., S. 8-12. *Daniel*

118. Fire Protection. Prevention, presuppression and suppression of forest and range fires. Economics and physical effects. Three credits. Fall, M. W. F. 8. *Floyd*

121. Forest Management. Physical factors influencing the regulation of a forest for sustained yield; site, growing stock and rotation. Compilation of data for management plans. Prerequisites: For. 106, 107, 115. Four credits. Fall, M. W. F. 9; Lab., T. 2-5. *Moore*

122. Forest Finance. Financial aspects of forest management, such as land, growing stock and stumpage valuation, forest taxation, and damage appraisal. Prerequisite: For. 121. Four credits. Winter, M. W. F. 10. Lab., W. 2-5. *Moore*

125. Logging. Methods of handling timber from tree to mill in the various forest regions. Three credits. Field trips arranged. Fall, M. W. F. 1. *Moore*

126. Wood Technology. Structure and identification of the economic woods of the United States. Three credits. Fall, Lab., M. W. F. 2-5. *Bowen*

129. Mechanical Properties. A study of the factors affecting the strength of wood. Two credits. Winter, T. Th. 8. *Bowen*

130. Milling and Products. Manufacturing, grading, seasoning, and preserving lumber, including a study of the wood using industries and their products. Four credits. Spring, M. T. W. Th. 9. *Bowen*

132. Public Land Administration. History, organization and functions of conservation agencies affecting range, forest and wildlife administration. Three credits. Winter, M. W. F. 8. *Floyd*

133. Forest Policy and Economics. Development of Federal, State and private forest policy. Economic problems in the production, distribution and consumption of forest products. Three credits. Winter, M. W. 11; Lab., M. 2-5. *Floyd*

137. Improvements and Recreation. Roads, trails and structures necessary in forest management. Recreational use of forests and the classifications and development of areas suitable for this purpose. Three credits. Spring, M. W. F. 10. *Floyd*

138. Recreational Planning. Mapping and designing plans for the various forms of forest recreational use. Three credits. Spring. One lecture, two lab. periods. *Floyd*

142, 143, 144. Forestry Seminar. Review and discussion of current forestry problems and practices. Lectures and labs. One credit each quarter. Fall, Winter and Spring. Time arranged. *Turner*

145. Forest Problems. Individual study and research upon a selected forestry problem approved by the instructor. One to three credits. Any quarter. Time arranged. *Staff*

146. Senior Field Problems. Study of forest operations. One credit. Spring of Senior Year. Fee $35.00. *Staff*

201, 202, 203. Advanced Forestry Seminar. Review and discussion of more advanced current literature. For students in the graduate school. One credit each quarter. Fall, Winter and Spring. Time arranged. *Turner*

204. Forest Ecology. Study of the historical and present distribution of forest species and forest types and the physical-biological basis of distribution. Three credits. Winter, M. W. F. 9. *Turner*

205. Silviculture. Advanced treatment of silvics and silviculture with emphasis on the physical aspects of the subject. Three credits. Winter, M. W. F. 10. *Daniel*

206. Forest Management. Application of forest management principles; forest organization and development; forest regulation and sustained yield; management principles and control of operations. Two credits. Fall, T. Th. 10. *Moore*

207. Forest Finance. Economic principles which control forest enterprises; capital value of forest properties; cost of production in forest enterprises; determination of rate of profit; principles of appraising damages; stumpage valuation and forest taxation and insurance. Two credits. Winter, T. Th. 10. *Moore*

208. Forest Measurements. Application of statistical measurements to forest problems. Three credits. Fall, M. W. F. 10. *Bowen*

209. Forest Economics. Study of economics of a private forest enterprise, including the economics of production, manufacture and marketing. Three credits. Fall, M. W. F. 9. *Floyd*

210. Forest Problems. Individual advanced study upon a selected forestry problem. Two to ten credits. Time to be arranged. *Staff*

211. Thesis. Original research on a problem in forest management to be concluded by preparation of a thesis. Ten to fifteen credits. Time to be arranged. *Staff*

Range Management

L. A. STODDART, *Professor;* ARTHUR D. SMITH, *Associate Professor;*
C. WAYNE COOK, *Assistant Professor.*

Upon completion of the course prescribed below, students are granted the degree of Bachelor of Science, major in Range Management.

The course in Range Management acquaints the stdent with methods of maintaining the production of native lands and methods of managing range livestock. An opportunity is given to take special instruction in soil conservation and watershed management with the election of certain courses during the junior and senior year. Studies in soil conservation acquaint the student with problems of soil erosion and methods of conserving water and managing lands, especially lands under native vetegation, in such a manner that productivity will be maintained.

The degree of Master of Science in Range Management will be granted upon completion of an arranged course of study. A period of one to two years and a total of forty-five residence credits, at least ten being individual research, are required. Students desiring this advanced work should obtain permission from the major professor at least twelve months before the degree is to be granted, at which time a program of research and study will be outlined. The choice of the research problem and of the specialization of study rests largely with the student. Adequate facilities are available to allow emphasis upon soil conservation, animal husbandry, botany, wildlife, economics, or agronomy. A bachelor's degree in Range Management or a related subject is prerequisite.

Several assistantships are available annually for students doing graduate work in range management. For information concerning these, prospective students should consult the department head.

COURSE OF STUDY

Freshman and Sophomore

Students majoring in range management will take the freshman and sophomore study program as outlined for the School of Forestry (Page 224) with the addition of A.H. 5 in the freshman year and A.H. 10 in the sophomore year.

Junior

		F	W	S
*Botany 108	Agrostology	—	4	—
Range 126	Plant Ecology	5	—	—
Range 162	Range Management	4	—	—
Wildlife 150	General Wildlife Management	—	—	5
*Range 177	Forbs and Browse	2	—	—
*Range 179	Poisonous Plants	—	—	2
Forestry 132	Public Land Adm.	—	3	—
*A. H. 110, 125	Beef Production, Sheep Production	3	3	—
Botany 120	Plant Physiology	—	5	—

Senior

		F	W	S
Range 164	Advanced Range Management	—	3	—
*Range 181	Range Economics	—	3	—
Range 192, 193, 194	Range Seminar	1	1	1
English III	Technical Writing	—	—	4
*Forestry 101, 102	Forest Survey	3	3	—
Range 180	Watershed Management	4	—	—

Suggested Electives

		F	W	S
A. H. 15	Fundamentals of Animal Breeding	3	—	—
Agron. 115	Biometry	—	3	—
Agron. 114	Soil Survey and Land Classification	—	—	3
W. L. 155	Economic Wildlife	—	3	—
For. 118	Fire Protection	3	—	—
Agron. 103	Forage Crops	—	—	4
Ag. Econ. 106	Land Economics and Utilization	—	—	5
Vet. Sci. 10	Animal Hygiene	—	4	or 4
Agr. 155	Soil and Plant Relations	—	3	—
Bot. 121	Water Relations of Native Plants	—	3	—
Geol. 115	Adv. Physical Geology	5	—	—

MAJOR—SOIL CONSERVATION AND WATERSHED MANAGEMENT

A major in soil conservation and watershed management is allowed with substitution of the following courses for those marked (*) above and for A.H. 10 in the Sophomore year.

		F	W	S
Agronomy 103	Forage Crops	—	—	4
Agronomy 125	Soil Conservation	—	—	3
Ag. Econ. 108	Eng. Aspects of Soil and Water Cons.	—	4	—
Geology 115	Advanced Physical Geology	5	—	—
C. Eng. 143	Hydrology and Meteorology	4	—	—
Range 176	Range Forage Plants	—	4	—
Botany 121	Water Relations of Native Plants	—	3	—
Agronomy 114	Soil Survey and Land Classification	—	—	3
Physics 114	Soil Physics	—	3	—

MINOR—RANGE MANAGEMENT

The following courses are suggested for students wishing to minor in Range Management. The requirements are subject to change upon approval of the department head.

Range 126	Plant Ecology	5 credits
Range 160	Principles of Managing Range Lands	5 "
Range 176	Range Forage Plants	4 "
Range 181	Range Economics	3 "
Range 192, 193, 194	Range Seminar	3 "

98. Range Practice. Field work in range management involving training in making range reconnaissance, estimating utilization, conducting technical range research, range improvement and management planning. Forestry summer camp. Lab. fee $5.00. Three credits. *Smith*

126. Plant Ecology. An analysis of habitat factors as they influence plant growth and distribution. Attention will be given to plant succession and competition and to detailed methods of studying and mapping vegetation. Prerequisite: Botany 30. Five credits. Fall, M. T. W. F. 11; Lab., M. 2-5. *Stoddart*

160. Principles of Managing Range Lands. A general course designed to give students not majoring in the field a knowledge of how to evalute, increase and perpetuate range. Attention is given to various grazing systems, livestock handling practices, and to the physiological effects of grazing upon plant life. Range maintenance and revegatation problems of various western range areas will be discussed, and students become acquainted with the important native forage plants and poisonous plants of each. Field trips and laboratory work on range plants. Prerequisite: Botany 22 or Botany 12. Three lectures, two labs. Five credits. Spring, M. W. F. 11; M. F. 2-5. *Cook*

162. Range Management. A technical course dealing with problems met in managing native range lands, including a study of grazing regions and the problems of each; revegetation of range lands; maintenance of production; utilization of range forage; and range livestock management as it affects range vegetation. Five credits. Prerequisites: Botany 30 and Range 98. Fall, Daily 10. *Cook*

164. Advanced Range. Technical problems in field methods, grazing reconnaissance, management plans and range administration. Especially designed to train men in range research and technical problems of administration. Prerequisites: Range 126 and 162. Three credits. Winter, M. W. F. 9. *Stoddart*

176. Range Forage Plants. Native forage plants, including poisonous plants, their identification, distribution, ecology, and economic value. Not open to range management majors. Prerequisite: Botany 30. Four credits. Winter, M. W. 1; Lab., M. W. 2-5. *Cook*

177. Forbs and Browse. A study of important non-grasseous forage plants, including identification, region of growth, habitat and forage value. Prerequisite: Botany 30. Two credits. Fall, W. 1; Lab., W. 2-5. *Cook*

179. Poisonous Plants. A study of important poisonous plants, including general methods of livestock handling and range management practices to avoid losses from poisonous plants. Included are identification, region of growth, habitat, poisoning symptoms, remedies and control measures. Prerequisite: Botany 30. One lecture, one lab. Two credits. Spring, W. 1; Lab., W. 2-5. *Cook*

180. Watershed Management. The study of floods, soil erosion and runoff on range and forest lands, the effects of vegetation in equalizing runoff and preventing erosion. Methods of rehabilitating damaged watersheds. Four credits. Fall, M. W. F. 10; Lab., T. 2-5. *Smith*

181. Range Economics. Development of the range industry, cost of production, range land utilization, organization of cattle and sheep industry, and value of range forage. Prerequisite: Range 162. Three credits. Winter, M. W. F. 10. *Smith*

192, 193, 194. Range Seminar. Current range management research and problems, including a systematic review of the field of range management and related fields. Prerequisite: Range 162. One credit each quarter. Fall, T. Th. 9; Winter, T. Th. 10; Spring, T. Th. 10. *Staff*

195. Range Problems. Individual study and research upon a selected range problem approved by the instructor. Open to range management majors or to others by approval of instructor. One to three credits. Time arranged. *Staff*

196. Senior Field Problems. Study of range management operations. One credit. Spring of senior year. Fee $30.

200. Thesis. Original research and study on a problem in range management or soil conservation, must be followed by the preparation of a formal thesis. This course is open only to graduate students upon approval of the major professor. One to 15 credits. Any quarter, time arranged. *Staff*

205. Graduate Seminar. Current scientific papers in range management, soil conservation, and related subjects, and an analysis of range problems in foreign countries. Not open to undergraduate students. One credit. Fall and Winter, time arranged. *Staff*

206. Research Methods. A study of research methods in range management and related subjects. A review of scientific literature in the field and an analysis of results. Open to undergraduate students only upon approval. Two credits. Winter, T. Th. 9. *Stoddart*

281. Advanced Range Economics. Advanced study of economics of various systems of range management, range seeding, land operation, and livestock management. Not open to undergraduate students. Two credits. Spring, T. Th. 9. *Smith*

282. Vegetation Influences. Advanced study of the influences of vegetation upon the hydrological cycle. Emphasis will be placed upon influence of vegetation on percolation of ground waters, runoff, and the regimen of streams. Prerequisite: Range 180. Two credits. Winter, T. Th. 11. *Smith*

Wildlife Management

G. H. KELKER, *Associate Professor;* J. B. LOW, *Associate Professor and Biologist, U. S. Fish and Wildlife Service;* W. F. SIGLER, *Assistant Professor.*

Upon completion of the basic courses and the upper division requirements as outlined in the study program, students are granted the degree of Bachelor of Science major in Wildlife Management. The basic courses of the freshman and sophomore years are tabulated on page 224. Prospective Wildlife Management majors should elect Zoology 3 and 4 in the sophomore year.

All juniors and seniors are expected to go on the annual five day spring field trip. The cost approximates $30.00.

Upon completion of a prescribed course and fulfillment of the requirements as listed in the Graduate School section of this catalog a Master of Science degree in Wildlife Management is given. A period of one to two years, depending upon the thesis problem and the amount of time which the student can devote to his studies, is necessary to complete all requirements for the degree. Subjects for thesis work are largely confined to problems dealing with economic status of those species closely related to the management of forests, ranges, or farmlands. Prerequisite to graduate work is a bachelor's degree in Wildlife Management or a related field.

Through the cooperation of the Fish and Wildlife Service of the U. S. Department of Interior, the Utah State Fish and Game Department, the Wildlife Management Institute, and the College, one of the ten federally sponsored Wildlife Research Units was established at Utah State College in 1935.

Through the establishment of this Wildlife Research Unit, funds are available for two to four graduate research fellowships for students working toward a master's degree in this field. Candidates for fellowships will be chosen from applicants who have a bachelor's degree in Biology, Forestry, or Agriculture from a college of recognized standing, and who submit formal application with transcript of college credits and references on or before May 1.

COURSE OF STUDY

Freshman and Sophomore Years—See Basic Courses, Forest, Range, and Wildlife Management, page 194.

Junior

Course	Dept.	Number			Credit		
		F	W	S	F	W	S
Entomology, Mammalogy, Ornithology	Zoo.	13	122	121	5	4	4
Ichthyology	Zoo.	—	—	155	—	—	3
Principles of Wildlife Management	Wildlife	145	—	—	3	—	—
Management of Game Birds	Wildlife	—	—	154	—	—	5
Plant Ecology	Range	126	—	—	5	—	—
Range Forage Plants	Range	—	176	—	—	4	—
Soils	Agron.	58	—	—	—	—	5
Problems	Wildlife	—	170	—	—	1	—

Senior

Course	Dept.	Number			Credit		
		F	W	S	F	W	S
Forest Survey	For.	101	102	—	3	3	—
Range Management	Range	162	—	—	5	—	—
Animal Ecology	Wildlife	160	—	—	—	—	3
Limnology	Wildlife	161	—	—	3	—	—
Marsh Management	Wildlife	—	—	263	—	—	3
Management of Big Game	Wildlife	—	153	—	—	5	—
Fish Culture	Wildlife	—	—	165	—	—	3
Seminar	Wildlife	157	158	159	1	1	1
Problems	Wildlife	170	—	—	1	—	—
Technical Writing	English	—	—	111	3	—	4
Aquatic and Marsh Plants	Bot.	112	—	—	3	—	—

99. Wildlife Practice. Lake and stream surveys and mapping for improvement purposes and for restocking; the use of census methods for big game, game birds, and rodents; cover mapping; preparation of animal skins; and study of deer and elk ranges. Three credits. Summer camp. *Kelker*

145. Principles of Wildlife Management. A study of the properties of animal populations, including food cycles, niches, pyramid of numbers, fluctuation, tolerance, movements, and succession. Three credits. Fall, T. Th. S. 8. *Kelker*

150. General Wildlife Management. Principles of animal ecology and wildlife management; life histories, ecology, economics and management phases of important species of big game, upland game, waterfowl, and fish. No credits allowed wildlife majors. Five credits. Field trips arranged. Spring, Daily 11. *Kelker*

153, 253. Management of Big Game. Life histories, distribution, numerical variation, enemies and plans for management of native big game animals. Prerequisite: Wildlife 145. Three lectures, one laboratory period and field work on Saturday. A term paper required of those doing graduate work. Five credits. Winter, M. W. F. 11; Lab., F. 2-5. One hour arranged. *Kelker*

154, 254. Management of Game Birds. Life histories, distribution, environmental needs, enemies and plans for management of native and introduced game birds. Prerequisite: Wildlife 145. Lectures, field trips and term paper. Additional work required of graduate students. Spring, Daily 8. *Sigler*

155. Economic Wildlife. General importance of the wildlife resource; natural history, economic values and control methods for rodents and predators; identification of skulls and skins; with a brief evaluation of hawks and reptiles. The course is particularly adapted for students in forestry, range, and agriculture. Three credits. Winter, W. F. 8; F. 2-5. *Kelker*

157, 158, 159. Wildlife Seminar. Discussion of current developments in Wildlife management. One quarter is given to comprehensive testing of subject matter. One credit each quarter. Fall, T. Th. 9; Winter, T. Th. 11; Spring, T. Th. 9. *Staff*

160 or 260. Animal Ecology. Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships of biotic communities. Additional assignment to graduate students. Three credits. Spring, M. 10; Lab., M. Th. 2-5. *Kelker*

161. Limnology. Physical, chemical and biological factors affecting occurrence and productivity of fishes and other aquatics in fresh and brackish waters. Prerequisite: Botany 30 and Zoology 13. Three credits. Fall, W. 10; W. F. 2-5. *Sigler*

263. Marsh Management. Marshland restoration and maintenance for waterfowl and aquatic furbearers; economic returns from marshlands; ecological plant succession and methods of restoration and maintenance of plant food and cover; management of public and private waterfowl shooting grounds; evaluation and control of predation and sickness; water level manipulation and controls for year-round operations of marshlands. Lectures, laboratory and field trips. Prerequisite: Wildlife 154. Three credits. Spring, M. W. 9; W. 2-5. *Low*

165, 265. Fish Culture. Principles of lake and stream improvement; food habits of game fishes, propagation methods, and common fish diseases. Prerequisites: Zoo. 155, Zoo. 138. Three credits. Spring, F. 9; Th. 2-5, one hour arranged. *Sigler*

169. Field and Laboratory Technique. Study of the scientific method; training in field observation and note taking; data analysis, hair, feather, bone and seed identification. Three credits. Winter, M. 8; Lab., T. Th. 2-5. *Sigler*

170. Wildlife Problems. Individual study and research upon a selected wildlife problem approved by the instructor. One to three credits. Any quarter. Time arranged. *Staff*

186. Senior Field Problems. Study of wildlife management operations. One credit. Spring of senior year. Fee $30.00. *Kelker*

257, 258, 259. Wildlife Seminar. Discussion of current developments in Wildlife Management. Two credits each quarter. Fall, Winter and Spring, time arranged. *Low*

270. Wildlife Thesis. (Graduate students.) Individual research is assigned to qualified students in problems of Wildlife Management. Five to ten credits per quarter. Any quarter. Time arranged. *Staff*

SCHOOL OF HOME ECONOMICS

ETHELYN O. GREAVES, *Dean.*

General Information

All Home Economics courses are intended primarily to prepare young women for the fundamentally important function of homemaking.

Admission to the School of Home Economics requires completion of 15 high school units of work including the following:

English	Three Units
Algebra	One Unit
Social Science	One Unit
Natural Science (requiring laboratory work)	One Unit
Elected (from the above groups and Modern Languages)	Three Units

The function of homemaking takes in all areas in the broad field of Home Economics. For this reason courses are planned to prepare young women to carry the knowledge and skills of expert homemaking into various institutions of complex modern society. Accordingly, students may elect majors leading to a Bachelor Degree in the following divisions of Home Economics:

CHILD DEVELOPMENT AND PARENT EDUCATION

CLOTHING, TEXTILES AND RELATED ARTS

FOODS AND NUTRITION

HOUSEHOLD ADMINISTRATION

HOME ECONOMICS EDUCATION

The chief professional opportunities open to majors in the School of Home Economics are (1) Child Development and Parent Education: Elementary Education; Nursery Education; Education for Parenthood. (2) Foods and Nutrition: Dietetics; Research; Institutional Management; Teaching. (3) Clothing, Textiles and Related Arts; Merchandising; Management; Teaching; Costume Design; Textile Research. (4) Household Administration: Homemaking. (5) Home Economics Education: Teaching; Homemaking.

A two-year terminal course in Home Economics subjects is offered for persons who are unable to complete a four-year course but who would profit from the pursuit of practical homemaking study.

In the first two years, students of Home Economics register for courses that will satisfy college requirements for graduation.

For the convenience of students these requirements are here summarized:

JUNIOR COLLEGE REQUIREMENTS

1.	Biological Science	8-12 credits
2.	Exact Science	8-12 "
3.	Language and Arts	8-12 "
4.	Social Science	8-12 "
	Total	32-48 credits

5. Six quarters of Physical Education.
6. Sophomore Composition (English 10 or 11).

All freshmen registering in the School of Home Economics and students transferring from junior colleges who do not have credit for a similar course are required to register for Home Economics Survey 10. This course deals with the orientation of the student into Home Economics and her guidance in the choice of a vocation related to this field. Open to all College women. One credit. Fall, Th. 11. *Staff*

TWO-YEAR TERMINAL COURSE IN HOME ECONOMICS

A two-year terminal course in home economics is offered for students who, for any reason, do not expect to complete any of the four-year majors in the homemaking group. The course is so planned, however, that students may without undue delay, complete later the work required for a four-year course.

While the course offers a broad foundation in homemaking, it also makes possible a concentration of effort on phases of home economics that will prepare the student for employment in specific fields.

REQUIREMENTS FOR TWO-YEAR TERMINAL COURSE

1. Complete a major of 30 credits in one or more closely related departments of the School of Home Economics.
2. Complete a minor of 15 credits related to or basic to the major field—not necessarily in the School of Home Economics.
3. Twenty-four credits in basic groups:
   a. Language ..... 9 credits
   b. Exact Science ..... 5 "
   c. Biological Science ..... 5 "
   d. Social Science ..... 5 "
4. Electives—21 credits.
5. Physical Education—6 credits.

Curricula in Home Economics

CHILD DEVELOPMENT AND PARENT EDUCATION

Freshman Year

Home Economics	Credit	Quarter		
C. T. & R. A. 9 (1)	3	F	W	S
H. E. 10 (1)	1	F	—	—
F. & N. 5 (1)	3	F	W	S
F. & N. 9 (1)	3	F	W	S
C. D. 70	3	F	W	S
Group Requirements (2) (3) (p. 47)	20	F	W	S
Other College Requirements (p. 47-48)				
Physical Education	3	F	W	S
Other Requirements on C. D. Major p. 240				
English 24	4	F	W	S
Electives (4)	8 or 9	F	W	S
	48 or 49			

Sophomore Year

Home Economics	Credit	Quarter		
C. D. 60	5	F	W	S
H. Ad. 65 (1)	3	—	W	S
C. T. & R. A. 55	3	—	—	S
F. & N. 35	3	—	—	S
Sociology 60	4	F	W	S
Group Requirements (2) (3) (p. 47)	20	F	W	S
Other College Requirements (p. 47-48)				
English 10	5	F	W	S
Physical Education	3	F	W	S
Electives (4)	5	F	W	S
	51			

(1) Suggested for the required 15 credits of General Home Economics.

(2) Prerequisites: Art 1, 2; Music 4, 5; Psychology 3.

(3) Group requirement recommendation: Physiology 4; Bacteriology 1; Physics 1; Sociology 10 or 70; Geology 1.

(4) Elective recommendations: Speech 18; Child Development 176; Woodwork 74.

Junior Year

	Credit	Quarter		
Other College Requirements (p. 47-48)				
English 110	4	F	W	S
Other Requirements, C. D. Major (p. 240)				
Psych. 110	3	F	—	S
Zool. 111	4	F	W	—
Certification Requirements (p. 51)				
Bact. 155	3	—	W	S
Psych. 112 (5)	3	—	W	—
Ed. 103	4	F	W	S
Ed. 104	3	F	W	S
Ed. 114	3	F	W	—
Home Economics				
C. T. & R. A. 24 (1)	3	F	W	S
Electives (4)	18	F	W	S
	48			

Senior Year

	Credit	Quarter		
Home Economics				
C. D. 175 A. & B.	5-7	F	W	S
C. D. 138	5	—	—	S*
C. D. 190	1	—	—	S
Certification Requirements				
Ed. 105	3	F	W	S
Ed. 106	12	F	W	S
Education Electives	2-3	F	W	S
Electives (4)	18	F	W	S
	48			

(1) Suggested for 15 credits of general Home Economics.

(4) Elective Recommendations: Speech 18; Child Development 176; Woodwork 74; Sociology 160; C. T. & R. A. 33, C. T. & R. A. 115.

(5) Recommended to fill required 45 credits for Certification.

*Alternate years given next in 1949.

CLOTHING, TEXTILES AND RELATED ARTS

Freshman Year

	Credit	Quarter		
Home Economics				
C. T. & R. A. 9	3	F	W	S
C. T. & R. A. 24	3	F	W	S
H. E. 10 (1)	1	F	—	—
F. & N. 5 (1)	3	F	W	S
C. D. 70 (1)	3	F	W	S
Group Requirements (2) (p. 47)	16	F	W	S
Other College Requirements (p. 47-48)				
Physical Education	3	F	W	S
Art Requirements				
Art 1	3	F	W	S
Art 2	3	F	W	S
Art 3	3	F	W	S
Electives (3)	10	F	W	S
	51			

Sophomore Year

Home Economics	Credit	Quarter		
C. T. & R. A. 25	3	F	W	S
F. & N. 9 (1)	3	F	W	S
C. D. 60 (1)	5	F	W	S
Group Requirements	15	F	W	S
Other College Requirements				
English 10	5	F	W	S
Physical Education	3	F	W	S
Art Requirements				
Art 33	3	—	—	S
Art 114	3	F	W	S
Electives (3)	5	F	W	S
	48			

(1) Suggested for the required 15 credits of Home Economics in addition to the major.

(2) Group requirement recommendations: Physiology 4; Bacteriology 1, 2; Psychology 3; Economics 51; Chemistry 10, 11, 12; Sociology 60, 70; Speech 1; History 4; World Literature 40.

(3) Elective recommendations: Clothing, Textiles and Related Art 33; Consumer Education 50; Household Administration 65; Landscape Architecture 3; Radio Speech 81; Music 80, 81; French.

Junior Year

Home Economics	Credit	Quarter		
C. T. & R. A. 105	3	F	—	—
C. T. & R. A. 115	3	F	W	—
C. T. & R. A. 125	3	—	W	—
C. T. & R. A. 140	3	—	W	—
C. T. & R. A. 170	3	—	W	—
Other College Requirements				
English 110	4	F	W	S
Art Requirements				
Art 123	5	F	—	S
Electives (3)	27	F	W	S
	51			

Senior Year

Home Economics	Credit	Quarter		
C. T. & R. A. 165	3	F	—	S
C. T. & R. A. 185	5	F	—	S
C. T. & R. A. 191	1	F	—	—
C. T. & R. A. 175	3	—	—	S
Electives (3)	36	F	W	S
	48			

(3) Elective recommendations: C. T. & R. A. 200; H. Ad. 149, 150; F. & N. 106; Physics 1; Political Science 101, 102, 110; Journalism; Literature; Art 104C.

FOODS AND NUTRITION

Freshman Year

Home Economics	Credit	Quarter		
H. E. 10 (required)	1	F	—	—
C. T. & R. A. 9 (1)	3	F	W	S
C. D. & P. E. 70 (1)	3	F	W	S
H. A. 50	3	F	W	S
Group Requirements (Page 47-48) (2)	28	F	W	S
Other College Requirements				
Physical Education	3	F	W	S
Electives (3)	7	F	W	S
	48			

Sophomore Year

Home Economics	Credit	Quarter		
C. T. & R. A. 24 (1)	3	F	W	S
F. & N. 20	4	F	W	—
F. & N. 21	4	—	W	S
C. D. 60	5	F	W	S
Group Requirements				
Chemistry 10, 11, 12	15	F	W	S
Other College Requirements				
English 10	5	F	W	S
Physical Education	3	F	W	S
Electives (3)	9	F	W	S
	48			

(1) Recommended for the Home Economics requirement of 15 hours in the various departments within the School.

(2) Recommended for group requirements: Physiology 4 and 5; Bacteriology and Public Health 1 and 2; Economics 5; Sociology 70; Speech 1; English 2. Note: (The first four courses listed are required of majors in Institutional Management.)

(3) Recommended for Electives: Psychology 3; Mathematics 34 or 35; Clothing, Textiles and Related Arts 25 and/or 27; Agricultural Economics and Marketing 62; Household Administration 65; Art 1 and 2; Speech 81; Physics 1; Typewriting; Physiology 11; Vegetable Crops 1; Sociology 60.

Junior Year

Home Economics	Credit	Quarter		
F. & N. 106	3	F	—	S
F. & N. 107	3	—	—	S
F. & N. 180	5	—	—	S
Chemistry				
Biochemistry	5	F	—	—
Other College Requirements				
English	4	F	W	S
Requirements for majors in Inst. Mgt.				
Psychology 102a and b	5	F	—	S
Education 120	3	F	—	S
Business Administration 100	3	—	W	—
Electives (3)	15	F	W	S
	48			

Senior Year

Home Economics	Credit	Quarter		
F. & N. 141a and b	6	F	W	—
F. & N. 145	4	—	W	—
F. & N. 146	3	F	—	—
F. & N. 190	3	F	—	S
F. & N. 191	3	F	W	S
Requirements for Majors in Inst. Mgt.				
F. & N. 182	3	—	W	—
F. & N. 183	3	—	W	—
Electives (3)	19	F	W	S
	44			

(3) Elective Recommendations: Journalism 112, 113, 114; Education 121, 121b; Bacteriology and Public Health 120; Foods and Nutrition 144; Household Administration 149; Business Administration 55; Economics 28.

HOUSEHOLD ADMINISTRATION

Freshman Year

Home Economics	Credit	Quarter		
H. E. 10	1	F	—	—
F. & N. 5	3	F	W	S
F. & N. 9	3	F	W	S
C. T. & R. A. 9	3	F	W	S
Group Requirements (1) (Page 47)	15	F	W	S
Physics 1	5	F	W	S
Other College Requirements (p. 47-48)				
Physical Education	3	F	W	S
Art Requirements				
Art 3	3	F	W	S
Electives (2)	12	F	W	S
	48			

Sophomore Year

Home Economics	Credit	Quarter		
H. Ad. 65	3	—	W	S
C. T. & R. A. 24	4	F	W	S
C. T. & R. A. 33	5	F	W	S
C. D. 60	5	F	W	S
Group Requirements (1) (Page 47)	15	F	W	S
Econ. 51	5	F	W	S
Other College Requirements				
Eng. 10	5	F	W	S
Physical Education	3	F	W	S
Electives (2)	5	F	W	S
	48			

(1) Group requirement recommendations: Physiology 4; Psychology 3; Sociology 70; Speech 1; History 4; Political Science 1; Art 1, 2; Misc. 1, 80, 81.

(2) Elective recommendations: Landscape Architecture 3; Sociology 60; Foods and Nutrition 35; English 24; Music 38; Journalism 15; Household Administration 50.

Junior Year

Home Economics	Credit	Quarter		
F. & N. 106	3	F	—	S
H. Ad. 149	3	F	W	—
C. T. & R. A. 55	3	—	—	S*
C. D. 70	3	F	W	S
Electives (2)	36	F	W	S
	48			

Senior Year

Home Economics	Credit	Quarter		
H. Ad. 150	3	F	W	S
Art Requirements				
Art 123	5	F	—	S
Other College Requirements				
Eng. 110	4	F	W	S
Electives (2)	36	F	W	S
	48			

(2) Elective recommendations: Zoology 111; Art 114.

Child Development and Parent Education

HELEN L. PORTER, *Assistant Professor;* ORAL PUGMIRE, WINNIFRED AMACHER, *Instructors;* LAWRENCE, S. BEE, *Associate Professor.*

(For Curriculum see page 235)

Students who select Child Development and Parent Education as a major are required to complete the following courses: English 24, Nutrition 35, Clothing, Textiles and Related Arts 55, Psychology 110, Zoology 111, Child Development 60, 70, 138, 175A and B, and Sociology 60.

Students who select Child Development as a minor should complete Child Development 60, 70 and 175, Nutrition 35 and Psychology 110.

Child Development majors are required to take 15 hours of general Home Economics credit other than those required on the major.

Many students majoring in Child Development also qualify for the elementary teacher's certificate. This may not, however, constitute a minor. Minors must be selected from the subject matter fields.

9. Child Care and Training. Open to all college girls and men desiring a course in the growth, development, care and training of the young child, this course is designed to meet in part the increased demand for the course in Child Guidance. The subject matter content is similar to that of C.D. 60. No nursery school observation can be offered to students enrolled, due to limited laboratory facilities. Child Development majors and others required to take C.D. 60 are not permitted to use this course as a substitute. Three credits. Fall, M. W. F. 8; Winter, M. W. F. 1. Sectioned. *Staff*

60. Child Development and Guidance. An introductory course planned to acquaint teachers, homemakers, social workers, and any others interested in working with children with some of the fundamentals of child growth and development, and to help them to develop a philosophy of guidance. Each of the following hours: 9, 10, 11, 12, 2, 3, should be free once during the week to allow for scheduling three laboratory hours for observation in the nursery school. Students who can free all but one of these hours should consult the instructor before registering. Open to students of sophomore standing or above. Prerequisite: C.D. 70. Five credits. Fall and Winter each year, also alternate Spring quarters. Fall, Spring, M. T. W. Th. 8; Winter, M. T. W. Th. 1; Sectioned. (Enrollment cards must be signed by instructor.) *Porter*

60A. Child Guidance. Required of all home economics transfer students who have had only two or three credits in child study. One credit is earned by three hours of observation weekly in the nursery school (see Child Development 60); the other is earned by one conference weekly with instructor. Two credits. Fall, Winter, Spring. Arranged. Sectioned. *Porter*

70. The Health of the Family. The anatomy and physiology of the reproductive system, preparation for motherhood, and the physical care of mother and child from the prenatal period to the end of the first year of the child's life. Three credits. Fall, Winter, Spring. Section 1, M. W. F. 10; Section 2, M. W. F. 1. *Staff*

138. Survey in Child Development. The history of the child development movement, present agencies and programs operating to further the welfare of children; nursery school administration. Open to Child Development majors only. Five credits. Offered in alternate years only to the combined group of juniors and seniors; offered next in 1949. Spring, Daily 8. *Porter*

140. Special Problems in Child Development. Open to qualified students majoring in Child Development, upon consultation with instructor. Any quarter. Time and credit arranged. *Staff*

175A. Nursery School Methods. This must parallel 175B. Study and collection of materials used in nursery school teaching, such as stories, pictures. Special consideration is given to understanding the needs of individual children in the Nursery School and evaluation of procedures used in guiding them. Two credits. Fall, Spring, T. Th. 1; Winter, T. Th. 8. *Porter and Pugmire.*

175B. Practice Teaching in the Nursery School. An opportunity to apply the principles of child guidance in the nursery school. Open only to Child Development majors and minors. Prerequisites: C. D. 60 and 70. Three to five credits. Any quarter. Time arranged. *Staff*

176. Advanced Practice Teaching in the Nursery School. A continuation of Child Development 175; an additional opportunity to work with young children. One conference weekly with instructor. Open only to Child Development majors. Prerequisite: C. D. 175. Required of majors with only three hours of 175B credit. Four to six credits. Any quarter. Time arranged. *Staff*

190. Seminar in Child Development. Discussions and reports of research in Child Development. Open only to Child Development majors. One credit. Spring, T. 5. *Staff*

Sociology 60. Courtship, Marriage and the Family. Designed to help unmarried students understand the roles of social and emotional factors in personality development, courtship, mate selection and marital adjustment. Open to all students. Four credits. Fall, Winter, Spring, M. W. Th. F. 11. *Bee*

Clothing, Textiles, and Related Arts

EFFIE BARROWS, *Professor Emeritus;* BERTHA F. JOHNSON, *Professor;* ....., *Associate Professor;* LILLIAN BREHM, *Assistant Professor;* RHEA HURST, *Assistant Professor, Extension Home Furnishings Specialist;* LOIS PEEL SMITH, *Assistant Professor, Extension Clothing Specialist;* FLORENCE GILMORE, *Instructor.*

Students who elect Clothing, Textiles and Related Arts as their major are required to complete the following courses: Clothing 9, 24, 25, 27, 105, 115, 125, 140, 165, 170, 175, 185, 191; Art 1, 2, 3, 33, 114, 123. Clothing, Textiles and Related Arts majors may elect to minor in Art, Education, Merchandising, Business, Foods and Nutrition, Child Development, Social Science, Physical Education, English, etc.

Clothing, Textiles, and Related Arts majors to be graduated from the School of Home Economics must have 15 hours of Home Economics besides the major, which should include representative subjects in Foods and Nutrition, Child Development and Household Administration.

The following courses are required for a minor in Clothing, Textiles, and Related Arts: 9, 24, 25, and 115. Other courses may be elected to complete the minimum of 18 credits required for a minor.

A two-day field trip to be taken in the Spring quarter is required of juniors and elective for seniors majoring in Clothing, Textiles, and Related Arts. Approximate cost, $10. The purpose is to study processes related to manufacturing and retailing of fabric and apparel, also to become acquainted with opportunities and requirements for employment in designing, manufacturing, merchandising, advertising, and interior decoration.

A home project to be carried out during the summer between the sophomore and junior years is required of all majors in Home Economics Education and Clothing, Textiles, and Related Arts. Clothing 25 is a prerequisite. The project is to be turned into the department within the first two weeks of the Fall quarter to be scored. The purpose of the project is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

5. Dress and Personality. Open to all college girls desiring assistance in planning and selecting campus clothes to suit personality and income. No construction. Girls who expect to major in Home Economics should take 9 instead of this course. Two credits. Fall, Sec. 1, M. W. 1; Sec. 2, T. Th. 9, Winter, M. W. 1; Spring, T. Th. 1. *Staff*

9. Clothing for the College Girl. Course designed to assist the college girl in selecting and adapting her clothes in terms of campus activities and personal expressiveness. Construction of one new garment. Open to all college girls. Three credits. Fall, Sec. 1, T. 2, Lab., T. 3-5, Th. 2-4; Sec. 2, T. 2. Lab., T. 3-5, Th. 2-4; Sec. 3, F. 9, Lab., W. 9-11, F. 10-12; Sec. 4, M. 9, Lab., M. 10-12, W. 9-11. Winter, Sec. 1, T. 2, Lab., T. 3-5, Th. 2-4; Sec. 2, W. 2, Lab., M. 2-4, W. 3-5; Sec. 3, Th. 9, Lab., Th. 10-12. Spring, Sec. 1, W. 2, Lab., M. 2-4, W. 3-5; Sec. 2, Th. 8, Lab., T. 8-10, Th. 9-11; Sec. 3, M. 9, Lab., M. 10-12, W. 9-11. *Staff*

15. Clothing Selection and Appreciation for Men. Men's apparel as related to the wearer. Consideration is given fundamentals of fabric selection. Organized to meet the needs of men from all schools of the college. Two credits. Winter, T. Th. 1. *Gilmore*

24. Textiles. Fibers, yarns, fabrics and finishes in relation to problems of the consumer. Prerequisite: Chemistry recommended. Three credits. Fall, Winter, Spring, M. W. 10; Lab., F. 10-12. *Gilmore*

25. Clothing, Selection and Construction. Consideration is given alteration of commercial patterns, fitting of a basic pattern in muslin, and techniques of designing from a basic pattern. One garment is constructed with emphasis upon selection, fitting, good procedures and finishes. Prerequisites: Clothing, Textiles and Related Arts 9, 24, and prerequisite or parallel Art 2. Three credits. Fall, Sec. 1, W. 2; Lab., M. 2-4, W. 3-5. Winter, Sec. 1, T. 2; Lab., T. 3-5, Th. 2-4. Spring, Sec. 1, T. 2; Lab., T. 3-5, Th. 2-4. *Brehm*

27. Household Textiles. Consideration is given fabrics for household and personal use, stressing selection, utilization, care and cost. Prerequisite: Textiles 24. Consumer Education 50 recommended. Three credits. Spring, Sec. 1, M. W. 1; Lab., F. 1-3. *Gilmore*

30. Construction Problems. Open to anyone having had Clothing 9 and 25 who wishes to develop more skill in construction techniques. Three credits. Fall, Sec. 1, F. 10; Lab., T. 11-1, F. 11-1. Winter, Sec. 1, F. 10; Lab., W. 11-1, F. 11-1. Spring, Sec. 1, F. 12; Lab., W. 12-2, F. 1-3. *Staff*

33. Home Furnishings. Planned to develop skill in selection and techniques in making, remodeling, and caring for home furnishings. The laboratory includes instruction on making of draperies, curtains, lamp shades, use of sewing machine attachments, refinishing and upholstering furniture. Open to all college girls. Outside work required. Three credits. Fall, Winter and Spring. Sec. 1, Th. 9; Lab., T. 9-11, Th. 10-12. Fall and Winter, Sec. 2, W. 2; Lab., M. 2-4, W. 3-5. *Gilmore*

55. Fundamentals of Family Clothing. Family clothing problems with special study and construction of children's garments from the standpoint of the aesthetic, physiological, and psychological development of children of different age levels. Prerequisite: Clothing, Textiles, and Related Arts 9 or 25. Three credits. Spring, Sec. 1, T. 2; Lab., T. 3-5, Th. 2-4. *Johnson*

105. History of Costume. Development of costume from ancient to modern times. Shows social, economic, political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. Prerequisite: History 4 recommended. Recommended for students in Home Economics, Costume Art, Physical Education, History, Speech and Dramatics. Three credits. Fall, M. W. F. 9. *Brehm*

115. Costume Design. Comprehensive study of art elements and principles of design as related to dress for the individual. Appreciation and ability to achieve beauty and art, quality in dress, in the home, and daily life is the aim of the course. Prerequisites for Home Economics Education and Clothing, Textiles, and Related Arts majors: Art 1 and 2; Clothing, Textiles and Related Arts 9, 24, and 25. Art and Clothing to satisfy the instructor for others. Three credits. Fall, Winter, Sec. 1, Th. 9; Lab., T. 9-11, Th. 10-12. Outside work required. *Johnson*

125. Applied Costume Design. Creative experience in dress designing by draping on the dress form. Emphasis is placed on fitting and understanding the effect of pattern, grain, and texture on design in dress. Problems consist of making a French lining and draping two garments. Prerequisites: Clothing, Textiles and Related Arts 9, 25 and 115. Three credits. Winter, M. 10; Lab., W. F. 10-12. Outside work required. *Johnson*

140. Decorative Textiles. Historic textiles, including printed and hand woven textiles, tapestries, damasks, oriental rugs, and laces. Laboratory work consists of weaving, needlecraft, and various means of developing decoration for garments, accessories, and household furnishings. Prerequisites: Art 1, 2, 3. Clothing, Textiles and Related Arts 105 and 115 prerequisite or parallel. Three credits. Winter, Th. 9; Lab., 9-11, Th. 10-12. *Brehm*

165. Tailoring. Application of techniques used in tailoring suits and coats. Prerequisites: Clothing, Textiles and Rleated Arts, 9, 24, 25, 115. Three credits. Outside work required. Fall, Spring. Sec. 1, Th. 9; Lab., T. 9-11, Th. 10-12. Winter. Sec. 1, M. 9; Lab., M. 10-12, W. 9-11. *Brehm*

170. Flat Pattern Designing. Basic principles underlying the design and construction of patterns for various figures. Includes drafting a basic pattern and provides opportunity for further study in designing, fitting and alteration of patterns. Prerequisites: Clothing, Textiles and Related Arts 9, 25, 115 and 125. Three credits. Spring. Th. 9; Lab., T. 9-11, Th. 10-12. Outside work required. *Brehm*

175. Textile Testing. The physical and chemical properties of the textile fibers, laboratory and household tests used in their identification, and the application of these factors to the choice and care of the fabrics. Consideration is given to the use of the microscope, physical testing and quantitative analysis. Prerequisites: Clothing, Textiles and Related Arts 24 and 27. Chemistry 10, 11 and 12 recommended. Three credits. Outside work required. Spring, T. 2; Lab., T. 3-5, Th. 2-4. *Gilmore*

185. Family Clothing Problems. Family clothing problems with emphasis on economic, sociological and psychological aspects. Practical problems may include: clothing budgets, selection of children's clothing, and care and renovation of clothing. Three credits. Fall, Sec. 1, F. 2; Lab., M. W. 2-4. Spring, Sec. 1, W. 2; Lab., M. 2-4, W. 3-5.

190 or 290. Special Problems. Independent study under direction of professor of a problem in clothing, textiles, or related arts in which upper division or graduate student has special interest or need. Consult department head before enrolling. Any quarter. Time and credit arranged. *Johnson and Staff*

191. Readings. Reports and discussion on current literature in clothing, textiles and related arts. Two credits. Spring, T. F. 11. *Johnson*

200. Commercial Clothing. Experience is given in constructing garments for the adult figures on a commercial basis with emphasis upon speed, efficiency, and fitting. Field trips to commercial custom tailoring and dressmaking shop and alteration departments to study shop management. Prerequisites: Clothing, Textiles and Related Arts 125, 165 and 170. Three credits. Winter, W. 2; Lab., M. 2-4, W. 3-5. *Johnson*

210. Research for Master's Thesis. Credit arranged. Fall, Winter. Spring. *Johnson*

Foods and Nutrition

ETHELYN O. GREAVES, UNA VERMILLION, *Professors;* ETHELWYN WILCOX, *Associate Professor;* EDNA PAGE, PRISCILLA ROWLAND, ELNA MILLER, *Extension Nutritionist, Assistant Professors;* LOUISE SPERRY, *Instructor.*

(For Curriculum see pages 237-238)

Students majoring in Foods and Nutrition are required to complete the following courses: Foods and Nutrition 20, 21, 106, 107, 141a and 141b, 145, 146, 180, 191; Chemistry 10, 11, 12; Biochemistry 111 and 112. Minors may be elected within any department of any other school in the College.

Those who expect to be graduated from the School of Home Economics must have 15 hours of Home Economics besides the major. These subjects should include representative courses in other departments within the school, i.e., Clothing, Textiles and Related Arts, Child Development and Household Administration.

In addition there are definite course requirements for the specialized fields within the Foods and Nutrition Department.

Institutional Management. The majors in this field will find all the requirements for this specialized subject listed in the 4 year outline in Foods and Nutrition on pages 237 and 238.

Research: Foods and Nutrition 144.

Journalism: Journalism 12, 112.

Certification for Teaching: (see page 51).

A Master of Science degree is offered in the field of Foods and Nutrition.

5. Principles of Nutrition. The relation of food to the health of the individual; factors influencing the body's nutritive requirements; problems applicable to the interest of the individual student. Three credits. Fall, Sec. 1, M. W. F. 9; Sec. 2, M. W. F. 1; Winter, Sec. 1, M. W. F. 9; Sec. 2, M. W. F. 10; Spring, M. W. F. 9. *Rowland*

9 Meal Preparation and Serving. Principles of food selection, preparation, meal planning and serving. Open to all women students not majoring in Foods and Nutrition. Three credits. Fall, Sec. 1, Lab., M. W. 2-5, Lect., F. 11; Sec. 2, Lab., T. Th. 11-2, Lect. F. 11; Sec. 3, Lab., W. F. 8-11, Lect., F. 11; Winter, Sec. 1, Lab., M. W. 11-2, Lect., 1; Sec. 2, Lab., T. Th. 11-2, Lect. 1; Spring, Sec. 1. Lab., M. W. 2-5, Lect. 11; Sec. 2, Lab., T Th. 11-2, Lect. 11.
Rowland and Sperry

10. Nutrition and Food Preparation. (For men.) Nutritive value of foods; present day problems in nutrition; selection of an optimal diet for health. Basic principles of food preparation and meal service. Open to men in all schools. Two lectures, one laboratory period. Fall, T. Th. 2, Lab., Th. 3-6. *Staff*

20. Food Selection and Preparation. Food composition, scientific methods of food preparation, and food buying problems. Two lectures and two laboratory periods with outside preparation. Prerequisite or parallel: Chemistry 10. Four credits. Fall, T. Th. 8; Lab., T. Th. 9-11. Winter, T. Th. 8; Lab., T. Th. 9-11. *Sperry*

21. Food Selection and Preparation. Continuation of Foods 20 with emphasis placed on meat cookery. Prerequisite or parallel: Chemistry 11. Four credits. Winter, M. W. 2; Lab., M. W. 3-5. Spring, T. Th. 8; Lab., T. Th. 9-11.
Sperry

35. Nutritional Requirements of the mother during pregnancy and lactation; nutrition of fetus and child through infancy to adolescence; feeding problems with children and correction of malnutrition. Prerequisite: Nutrition 5. Three credits. Spring, M. W. F. 8. *Carlson*

100. Quantity Food Preparation for School Lunch and Special Occasions. Designed to meet the needs of teachers of Home Economics in High School. Emphasis placed upon the planning of balanced school lunches. Instruction given in the organization, preparation and service of foods for special occasions, involving large groups. Prerequisites for vocational majors: Foods 20 and 21. Others consult instructor. Three credits. Spring, T. Th. 9; Lab., M. or W. 9-12. *Vermillion*

106. Meals for the Family. The planning, preparation, and serving of meals for the family with consideration given to the nutritional adequacy of the meals at different levels of income. One lecture and two laboratory periods with outside preparation. Prerequisites: Foods 20 and 21, or Foods 9. Three credits. Fall and Spring, F. 11; Lab., M. W. 11-1. *Sperry*

107. Experimental Cookery. Development of experimental methods; their application to investigation in cookery and food preservation; acquaintance with the literature in the field; preparation of the student for independent investigations in foods. Prerequisites: Chemistry 5 or 11; Foods 20 and 21. Three credits. Spring, Th. 2, Lab., Th. 3-5, F. 2-5. *Wilcox*

141a and b. Advanced Nutrition. Application of the fundamentals of biochemistry to the nutrition of man with practice in the calculation dietaries in health. Consideration is given to nutrition of the child at all ages. Prerequisites: Biochemistry 111, 112 or equivalent. Three credits. Fall, M. W. F. 8; Winter, T. Th. 8, M. 1. *Wilcox*

142. Nutrition and Dietetics. A review of the fundamentals of chemistry and biology as applied to human nutrition with practice in the calculation of dietaries in health and in disease. Required of all Home Economics Education students. Prerequisite: Organic Chemistry. Four credits. Fall and Spring, M. W. F. 8, Lab., Th. 2-4 *Greaves*

144. Laboratory Methods in Foods and Nutrition. Problems in foods and human nutrition including nitrogen, mineral, and vitamin determinations. Prerequisites: Bacteriology and Biochemistry 111 or permission of instructor. Two credits. Winter, T. 9-11, Th. 9-12. *Wilcox*

145. Diet Therapy. Application of dietetic principles to problems of diet in disease with calculation of dietaries in disease. Prerequisite: Nutrition 141. Four credits. Winter, M. W. F. 9; Lab., T. 2-4. *Greaves*

146. Food Technology. A study of manufacture and preservation of food products and the influence of these processes on the physical, chemical, and nutritive values of foods. Prerequisites: Bacteriology 1 and Foods 21. Three credits. Fall, Lect., M. W. 9; Lab., F. 2-5. *Greaves*

160. Special Problems. Open to qualified students majoring in Foods and Nutrition upon consultation with the instructor. Any quarter. Time and credit arranged. *Wilcox*

180. Quantity Food Preparation. Principles of cooking applied to large quantity preparation and service; standardization of foods with reference to quality and production cost; use and operation of equipment. Food and service units used as laboratories where students assist in preparation and service of foods in large quantities. Open only to Seniors, food majors in institutional economics. Prerequisites: Foods and Nutrition 5; Foods 20 and 21. Five credits. Fall, M. W. F. 10; Lab., T. Th. 9-12. Open to Juniors majoring in Institutional Management. Spring, M. W. F. 8; Lab., 10-1. *Vermillion*

182. Institutional Organization and Management. Principles of scientific management applied to institutions; emphasis on forms of business organization, employer-employee relations, keeping of accounts and inventories and general administrative problems. For majors planning to enter the field of institutional economics. Three credits. Winter, M. W. F. 10. *Vermillion*

183. Food Selection and Purchase for the Institution. Consideration of sources, grading, standardization, basis of selection, methods of purchases, and storage of various classes of food. A two day trip to Ogden or Salt Lake markets and institutions. Approximate cost $12. Prerequisites for majors: Foods and Nutrition 180 and 181. Others consult instructor. Three credits. Winter, M. W. 11; Lab., W. 2-5. *Vermillion*

191. Seminar in Foods and Nutrition. Reports, discussions, and review of recent scientific literature in Nutrition. Prerequisite: Foods and Nutrition 141 or 142. Three credits. Spring, M. W. F. 11. *Greaves*

201. Laboratory Methods in Foods and Nutrition. Three credits. *Wilcox*

202. Biological Asay of Foods. Three credits. *Wilcox*

210. Research for Master's Thesis. Credit arranged. *Wilcox*

291. Seminar. Two credits. *Wilcox*

Household Administration

ALMEDA P. BROWN, *Professor Emeritus;* ETHELYN O. GREAVES, *Professor;* ORETTA M. CARLSON, *Instructor.*

(For Curriculum see page 239)

A Bachelor of Science degree in Household Administration affords the student a wide choice of courses by requiring only those basic to a cultural training in homemaking. Opportunity is offered for studying effects of social and economic forces on the home and its management.

50. Consumer Education. The consumer's problems as they relate to food, clothing and household management. Emphasis is placed on money management in the home. Three credits. Fall and Winter, M. W. F. 8. Spring, M. W. F. 1. *Staff*

65. Housing Problems. A social and economic study of the types, organization, plan and equipment of modern housing and the changes brought about by inventions, scientific discoveries, educational progress and other leading developments. Consideration of present housing needs and practices affecting housing construction and home ownership. Three credits. Winter, M. W. F. 9. Spring, M. W. F. 11. *Carlson*

149. Economics of Household Consumption and Production. An economic analysis of household production; source and distribution of family income under different conditions; practice in planning budgets for specific families; and laboratory work in the scientific consideration of household standards and organization. Required of all students before residence in the Home Management House. Prerequisites: Foods 20, 21 and 106 for all Home Economics Education students; others, Foods 9 or 106. Three credits. Fall and Winter, M. W. 11; Lab., F. 11-1. *Staff*

150. Residence in the Home Management House. Required of home economics education and of household administration majors. For these students H. Ad. 149 is prerequisite. Elective for other senior college students upon consultation with the dean of home economics and the director of the Home Management House. During the six-weeks residence students are directed in the application of scientific principles to the practical management of home problems. Three credits. Time arranged. *Brown*

Home Economics Education

HELEN L. CAWLEY, *Assistant Professor.*

A Master of Science degree may be earned in Home Economics Education.

Education 120 Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; an appreciation of methods of teaching in education for home and family living. Prerequisite or parallel: Psychology 102. Three credits. Fall, Spring, T. Th. S. 8. *Cawley*

Education 121. Problems in Teaching Home Economics. Study of recent investigations in the field of Home Economics and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) It is suggested that this course be blocked with Education 122a and with one other three-hour Education* course so that concentrated work may be participated in on the campus prior to and following the off-campus student teaching experience. Prerequisite: Education 120. Four credits. Winter, Spring. Time arranged. *Cawley*

Education 122a. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement. Student teachers leave the campus the middle five or six weeks of Fall or Winter and teach each day a full homemaking program in one of the approved schools. An occasional student may find it impossible to do the teaching on this block plan. Such a student must receive approval of the instructor of Education 121 and 122, preferably at beginning of her junior year, to make other arrangements for her student teaching. In the latter case, the student teacher will teach at least two hours daily in an approved local school in Spring. Prerequisite: Education 120 and Education 121. Eight credits. Winter, time arranged. *Cawley*

Education 122b. Student Teaching in Home Economics for Non-Vocational Education Majors. For student dietitians whose responsibilities will involve teaching student nurses, student dietitians, and patients. For other non-vocational homemaking education majors who are interested in securing practical teaching experience. In Spring the student teacher will teach at least one hour daily in an approved local school. Prerequisite: Education 120 with Education 121 taken the same quarter as Education 122b. Four credits. Spring. Time arranged. *Cawley*

Home Economics 199. Special Problems in Home Economics Education. Developed around individual needs of students which are not otherwise provided for in curriculum. 1-2 credits. Any quarter. Time arranged. *Cawley*

Home Economics 210. Research for Master's Thesis. Credit arranged. *Cawley*

Field Trip. For senior girls and graduate students enrolled in homemaking education. Trip will be planned cooperatively by students and homemaking education staff. Trip will probably take place during the spring quarter, and the estimated cost to participants will be given in advance.

*It is necessary to make arrangements for specific Education course with major professor at the time when plans are being made for Education 121 and 122a.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS

Ground and Air

COLONEL E. W. TIMBERLAKE, *CAC, Commandant, PMS and T.*

General Information

COLONEL E. W. TIMBERLAKE, *CAC, Commandant, PMS and T;* LT. COL. JAMES C. BRADFORD, *QMC;* LT. COL. HAROLD E. COTTER, *AC;* MAJOR HAROLD D. HIGGANS, *CAC;* MAJOR JOSEPH R. MEACHAM, *CAC;* CAPTAIN ALLEN G. MCCLURE, *AC;* CAPTAIN WILBUR J. SCHINDLER, *AC, Assistant Professors;* M/SGT. MILO E. HOLDEN, *DEML;* M/SGT. JOHN L. HOLLAND, *DEML;* M/SGT. NORMAN F. JONES, *DEML;* M/SGT. FREDERICK V. MCWOLD, *DEML;* 1ST SGT. MARVIN L. BRIMMER, *DEML;* 1ST SGT. WALTER B. SPEED, *DEML;* T/SGT. JOSEPH C. HUGHES, *DEML;* T/SGT. VAL M. JOHNER, *DEML;* T/SGT. CHARLES J. LEPLEY, *DEML;* T/SGT. PAUL H. WESSMAN, *DEML;* T/SGT. BONNER D. WIMBERLY, *DEML, Instructors;* PROFESSOR N. W. CHRISTIANSEN, *Band Instructor.*

UTAH State Agricultural College, having accepted the provisions of the Act Congress approved July 2, 1862, is classified as a Land-Grant College and is therefore obliged to offer a course in Military Science and Tactics as a part of the College curricula. The obligations to provide military instruction on Land-Grant institutions by the Act of July 2, 1862, are not altered by the National Defense Act of 1920 as amended.

Recognizing that preparation for national defense is an important duty of citizenship, and that qualities of patriotism, loyalty, discipline, leadership, and respect for constituted authority inculcated by proper military training are valuable in the formation of character, it has been the consistent policy of the College to cooperate with the Federal Government in making the Department of Military Science and Tactics as effective as practicable.

At the request of the College authorities a senior unit of the Reserve Officers' Training Corps was authorized at this Institution by the President of the United States under the provisions of Section 33 of the Army reorganization Act of June 4, 1920. Accordingly, the Board of Trustees has agreed to maintain a two-year basic course in Military Science and Tactics as a required subject for all qualified male students.

The primary object of establishing units of the Reserved Officers' Training Corps is to qualify students for appointment in the Officers' Reserve Corps of the United States Army. This training will also be as valuable to the student in his industrial or professional career as it would be should the nation call upon him to act as a leader in its defensive forces.

Enrollment in the Reserve Officers' Training Corps is not in any sense "conscription," nor does it convey liability to service in any component or branch of the United States Army. As its name implies, the R. O. T. C. is an instrument of training and instruction only.

Military Science Regulations

The student, by registration at the Institution, obligates himself to conform to such requirements as are or may be prescribed by the College under regulations of the Reserve Officers' Training Corps. These requirements follow: Two years of military training (six credits) are required of all qualified male students. By regulations of the College elementary course is normally required during the first and second years at the Institution.

To remain in and receive instruction at the College or to graduate from the College, the student must attend military classes and do satisfactory work in them.

It shall be the duty of every student of whom military training is required, to see that he is properly registered for the course and to report for instruction. Students who are required to take military training but fail to register or to report for classes will, with the approval of the President, be excluded from all classes in the College. The responsibility of complying with the regulations regarding Military Science rests entirely with the student.

The hour 11 o'clock on Thursdays is reserved exclusively for Military Drills. No other classes will be allowed to conflict with this hour.

A student claiming exemption from Military Science will present a petition for such excuse at the time of registration. Pending the action of the petition, the student will register for the course prescribed and will enter upon the work of such course.

Any student who may be excused from attendance in Military Science for and valid reason must make up the deficiency in other departments of study.

Every student registered for Military Science is required to make a uniform deposit of $5.00. A laboratory fee of $1 will be deducted from this deposit. The balance, less the cost of any property lost or damaged, will be refunded upon the completion of the year or upon withdrawal from the course.

Reserve Officers' Training Corps

The four years' course in the Reserve Officers' Training Corps is divided into the Elementary Course and the Advanced Course.

The Elementary Course consists of the first two years in Military Science and normally corresponds to the freshman and sophomore years. When entered upon by any student it shall be a prerequisite for his graduation unless he is relieved from this obligation by proper authority. Students transferring from institutions not having R. O. T. C. Units must enroll.

The Advanced Course consists of the third and fourth year of Military Science. Entrance upon the Advanced Course is elective, but once entered upon, it becomes a prerequisite for graduation, unless the student shall be honorably discharged in accordance with provisions of Army Regulation 145-10.

Student electing Military Science as a major subject should do so at the beginning of the freshman year in order that sufficient time may be available to complete the Advanced Course. The School of Arts and Sciences offer a major* in Military Science.

Uniforms and Equipment

A serviceable uniform of standard army pattern is furnished by the War Department to each student taking military training. Shoes are not furnished. Each student should provide himself with a pair of brown shoes before entering the College, as they will be required immediately upon his admission.

The uniform and equipment issued for the use of a student, remains the property of the United States. At the end of each year, or at such other times as students may terminate their military training, all clothing and other supplies will be returned in a serviceable condition, not later than one week following the termination of such training. Articles which have been lost, damaged, or destroyed will be charged against the student concerned.

Any student not returning the previously mentioned uniforms and equipment or not paying for articles lost shall have suspended all college credit earned at this institution until the debt to the college is liquidated.

ELEMENTARY COURSE

Students in the Elementary Course are required to pursue their courses diligently until satisfactorily completed, and to meet such requirements for care of equipment as may be prescribed. In case of failure in any quarter, the student is required to repeat the work.

*A Department Major in the School of Arts and Sciences is offered in Military Science and Tactics. Prescribed requirements are: M.S. and T. 36 credits. Mathematics 34, 35, 46, 97, min. 30 credits; French, German, Portuguese or Spanish, two years; Surveying 81, 82 and 83, 8 credits; Chemistry 3, 4 and 5 or 10, 11 and 12, 15 credits; Physics 20, 21 and 22, 15 credits; Political Science 10 and 102, 8 credits. History 17 and 21, 10 credits.

General conditions for enrollment in the ROTC. All students formally enrolled in the elementary and advanced course of the Senior Division ROTC must be—

1. Citizens of the United States.
2. Physically qualified, under standards prescribed by the War Department (see AR 40-105 and 40-110). Due allowance will be made for those defects which are correctible before the student, who is otherwise qualified, becomes eligible for appointment as a commisioned officer.
3. Accepted by the institution as a regularly enrolled student of the institution.

In addition to the general conditions for enrollment in the ROTC enumerated above all students formally enrolled in the Elementary Course must comply with the specific conditions listed below:

1. Be not less than 14 years of age and must not have reached 23 years of age at the time of *initial* enrollment in the *Elementary Course.*
2. Successfully complete such general survey of screening tests as may be prescribed.

ADVANCED COURSE

In addition to the general conditions for enrollment in the ROTC enumerated in the Elementary Course above, all students formally enrolled in the Advanced Course ROTC must comply with the specific conditions listed below:

1. Not have reached 27 years of age at the time of initial enrollment in the Advanced Course. Formally enrolled members of the Advanced Course are exempt from registration, induction, training, or service under section 5a of the Selective Training and Service Act of 1940 as amended.
2. Successfully complete such survey and general screening tests as prescribed.
3. Be selected by the PMS and T and the head of the institution.
4. Execute a written agreement with the Government.
5. Have completed the Elementary Course or equivalent thereof.
6. Be enrolled in an academic field prescribed by the chief of a technical service if admission to the Advanced Course in a unit of a technical service is desired.

Credit for active military or naval service in lieu of the Elementary Course, R.O.T.C. Veterans who have been honorably discharged, or transferred to the Enlisted Reserve Corps and relieved from active duty, are given credit under the provisions of Public Law 81—79th Congress, in lieu of completion of all or part of the basic course, R.O.T.C., on the following basis:

a. For not less than six months' active service in the Army, Navy, Marine Corps, or Coast Guard, credit in lieu of the first year Elementary Course.

b. For not less than one year of such active service, credit in lieu of the entire Elementary Course.

Separate contracts will be executed between the Government and students enrolled in the Advanced Course. Such a contract will require a student to complete the Advanced Course of training and to attend the Advanced Camp at the time specified unless he is soon discharged for the convenience of the Government. The contract will not specify that the Advanced Course must be pursued without interruption. However, the contract will be canceled if the

Advanced Course is interrupted for two calendar years. During their period of participation in the Advanced Course, duly enrolled students will be paid monthly a monetary allowance in lieu of subsistence at a daily rate equal to the value of the commuted ration. Upon obtaining the necessary legislation, such students will be paid an additional allowance in lieu of quarters and uniform at the rate of $1.25 per day.

Students attending ROTC summer camp will be messed and quartered and will be paid at the rate prescribed for soldiers of the 7th grade. The War Department will seek legislation authorizing the payment to students attending the ROTC summer camp at the rate prescribed for soldiers of the 6th grade. A travel allowance from the institution to camp and return to the institution at the rate of 5 cents a mile will be authorized students eligible to attend the advanced summer ROTC camp.

R. O. T. C. Band

A military band is an element of the Reserve Officers' Training Corps, under the direction of the Band Instructor, and is governed by the rules of the Department of Military Science and Tactics. Uniforms and instruments are furnished by the War Department.

Members of the band will be selected from among those students who are registered in Military Science and who have demonstrated their ability for such selection. Tryouts for the band will be conducted under the supervision of the Band Instructor and will be held preferably during the first two weeks of each quarter. Members of the band receiving credit in Military Science will be limited to not more than sixty students.

Students who are selected for the band will be required to take all theoretical work in Military Science and sufficient practical drill to insure their making a creditable appearance in ranks. They will play with the band only at regular drill formations.

Credits

Students satisfactorily completing the Elementary Course receive one credit per quarter, which may be included in the 186 credits required for graduation.

Students satisfactorily completing the Advanced Course receive three credits per quarter, which count toward the 186 credits required for graduation. In addition, students enrolled in the Advanced Course will receive six credits for satisfactory completion of the six weeks' course at the Advanced Camp, conducted annually and normally attended after completion of the first year of Advanced Course. If the length of the summer camp is increased the credits allowed for summer camp will be increased accordingly, on the basis of one credit for each additional week, up to a total of nine weeks.

Students majoring in the Schools of Arts and Sciences, and Engineering may submit Advanced Military Science as a minor for graduation.

Members of the band who successfully complete the work in the various quarters receive credits as follows: First and second years, one credit per quarter in Military Science.

Courses of Instruction

Classes in Military Science will not be held at times other than as scheduled, but any student desiring extra instruction may make the necessary arrangements with the Professor of Military Science and Tactics.

ELEMENTARY COURSES

1, 2, and 3. Military Science. First year. Fall, Winter and Spring. One credit per quarter. For hours see schedule bulletins. *Staff*

4, 5, and 6. Military Science. Second year. Fall, Winter and Spring. One credit per quarter. For hours see schedule bulletins. *Staff*

These courses follow the Program of Instruction for First and Second Year Elementary Course ROTC, laid down in War Department Memorandum 145-46, dated 19 June 1946. They cover the following subjects:

World Military Situation

Military Organization

Hygiene and First Aid

Leadership Drill and Exercise of Command

Physical Development Methods

Individual Weapons and Marksmanship

Maps and Aerial Photographs

National Defense Act and ROTC

Military Administration

Evolution of Warfare

Military Law and Boards

These new courses contain the latest developments and trends in tactics and technique and the latest materiel is available to supplement the instruction.

R.O.T.C. BAND COURSES

1B, 2B, 3B. R.O.T.C. Band. First year. On credit per quarter. For hours see schedule bulletins. *Christiansen*

4B, 5B, 6B. R.O.T.C. Band. Second year. One credit per quarter. For hours see schedule bulletins. *Christiansen*

ADVANCED COURSES

101, 102 and 103. Military Science, Artillery. The course is composed of the newly instituted Post-War ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for first year advanced (Antiaircraft Artillery) ROTC students. In the staff and administrative subjects emphasis is placed on the psychology of leadership and military problems of the United States. The branch material subjects are concerned specifically with the latest developments and trends in Tactics and Technique of antiaircraft units of all echelons. The latest materiel and training aids available are used to supplement the instruction. The ultimate goal of the course is a commission as a Second Lieutenant in the Officers Reserve Corps. Three credits per quarter. *Staff*

104, 105 and 106. Military Science, Antiaircraft Artillery. The course is composed of the newly instituted Post-War ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for second year advanced (Antiaircraft Artillery) ROTC students. In the staff and administrative subjects considerable time is devoted to the study of psychological warfare, command and staff duties, geographical foundation of national power and military teaching methods. The branch material subjects are concerned specifically with the latest developments and trends in Tactics and Technique of antiaircraft units of all echelons. The latest materiel and training aids available are used to supplement the instruction. The completion of this course constitutes the military academic requirement for a commission as a Second Lieutenant in the Officers Reserve Corps. Three credits per quarter. *Staff*

111, 112 and 113. Military Science, Quartermaster. The course is composed of the newly instituted post-war ROTC program of instruction. Training is provided in branch material and staff and administration subjects for first year advanced (Quartermaster Corps) ROTC students. In the staff and administrative subjects emphasis is placed on the psychology of leadership and military problems of the United States. The branch material subjects are concerned specifically with the latest developments and trends in Tactics and Technique of Quartermaster Corps unites of all echelons. The latest materiel and training aids available are used to supplement the instruction. The ultimate goal of the course is a commission as a Second Lieutenant in the Officers Reserve Corps. Three credits per quarter. *Staff*

114, 115 and 116. Military Science, Quartermaster. The course is composed of the newly instituted Post-War ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for second year advanced (Quartermaster Corps) ROTC students. In the staff and administrative subjects considerable time is devoted to the study of psychological warfare, command and staff duties, geographical foundation of national power and military teaching methods. The branch material subjects are concerned specifically with the latest developments and trends in Tactics and Technique of Quartermaster Corps units of all echelons. The latest materiel and training aids available are used to supplement the instruction. The completion of this course constitutes the military academic requirement for a commission as a Second Lieutenant in the Officers Reserve Corps. Three credits per quarter. *Staff*

121, 122, 123. Military Science, Air. This course is composed of the subjects that were offered for the first time during the year 1946-47. They are in line with the newly instituted post-war ROTC program of instruction. Training is provided in the branch material and in the staff and administrative subjects for first year advanced (Air Corps) students. In the branch material subjects, students will become familiar with the duties of the Air Corps in general and will gain a background from which they will be basically qualified to perform duties as they are assigned to the usual officer. These subjects are concerned specifically with the latest developments and trends in Tactics and Techniques of the Air Corps units of all echelons. The latest materiel and training aids available are used to supplement the instruction. Three credits per quarter. *Staff*

124, 125, 126. Military Science, Air. This course will be offered for the first time during the year 1947-48. The student will be given one specific subject, under the branch material subjects, which will qualify him for a particular job in relation to the Air Force. The choice of courses will probably be as follows: Communications; Armament; Engineering Maintenance; and Personnel Administration. Final decision as to the exact courses to be given will depend on the Air Corps Headquarters. The latest materiel and training aids available are used to supplement the military academic requirement for a commission as a Second Lieutenant in the Officers Reserve Corps which is the final goal of the ROTC training. The staff and administrative subjects will include such studies as those of Psychological Warfare, Command and Staff Duties, Geographical Foundation of National Power and Military Teaching Methods. Three credits per quarter. *Staff*

These courses are designed to produce future officers of the Air Corps who are thoroughly skilled in the particular duties they are to perform so they may accomplish their assignment as efficiently and economically as possible. In addition to this training each student will be given approximately ten hours of flying time as an orientation course so that he may better understand the place of importance that his particular job occupies. If a student so desires he may indicate his desire to become a pilot and after receiving his commission as a Second Lieutenant he will be sent to the regular pilot training school which will take approximately one year. Any such student will have a priority for training next to that of graduate of the U. S. Military Academy. This additional training will not be required of any student and can be obtained only by individual application.

SPONSOR DRILL COURSES

51, 52, 53. Military Science, Sponsor Drill. Fall, Winter and Spring. T. Th. 1. A drill course for girls elected to the Corps of Sponsors. *Staff*

54, 55, 56. Military Science, Sponsor Drill. Fall, Winter and Spring. T. Th. 1. A drill course for girls elected to the Corps of Sponsors. Prerequisite: M. S. 51, 52, and 53. *Staff*

GIRLS' RIFLE COURSES

61. Military Science, Girls' Rifle Course. Fall, Winter and Spring, M. W. F. 9. A basic course in markmanship for girls. Laboratory fee $2.00. *Staff*

62. Military Science, Girls' Rifle Course. Fall, Winter and Spring, M. W. F. 10. An advanced course in markmanship for girls. Prerequisite: M. S. 61. Laboratory fee $2.00. *Staff*

ADVANCED CAMP

110. Military Science, Artillery.

120. Military Science, Quartermaster.

130. Military Science, Air.

The advanced camp will consist of practical and theoretical military instruction of a specialized type and will be of six weeks' duration. The War Department will seek legislation to extend the period of the advanced camp to eight weeks. Students will normally attend the advanced camp between the two academic years of the advanced course. Credits for advanced summer camp will be on the basis of one credit for each week of attendance.

RESEARCH AND EXTENSION

AGRICULTURAL EXPERIMENT STATION

R. H. WALKER, *Director.*

THE Agricultural Experiment Station, established in 1889, is a major division of the College. It is charged with the responsibility of conducting research in Utah under provisions of the Hatch, Adams, Purnell, and Bankhead-Jones Acts of Congress, and of various acts of the Utah State Legislature. Its primary objectives is to conduct experiments and scientific researches that have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry and the development and improvement of the rural home and rural life. The research results are prepared for dissemination in the form of bulletins and scientific articles. They form the basis for much of the work of the Agricultural Extension Service.

The staff of the Agricultural Experiment Station numbers approximately 90, many of whom are also members of the teaching faculty of the College; some of them also divide their time with the Agricultural Extension Service of the College. In addition, several employees of various bureaus of the U. S. Department of Agriculture are assigned to work on the campus and collaborate in the agricultural research program of the station.

The main offices of the Agricultural Experiment Station, including the office of the Director, and the Division of Publications, are on the College campus, on the first floor, south wing of the Main Building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed as necessary among the various College buildings.

Greenhouses are maintained for investigations in horticulture, vegetable crops, agronomy, botany, plant pathology, entomology, bacteriology and range management.

Livestock husbandry investigations are conducted at the barns on the College campus, at the Branch Agricultural College, at the U. S. Forest Service Desert Range Station, and on the ranges in different parts of the state.

The Station also maintains a number of experimental farms:

At the **Dairy Experimental Farm,** composed of about 100 acres of land, barns and a house, the Station, maintains an experiemental Holstein dairy herd of about 60 pure-bred animals. Pasture investigations are also conducted here.

The Greenville Farm, a 45-acre tract, is used for experimental work in plant breeding and other phases of crop production.

The Farmington Substation at North Farmington is a 50-acre tract used for experimental work in horticulture and vegetable crops.

At the **Nephi Farm** experimental work in dry farming and range seeding is conducted. This farm is composed of 103 acres.

The Forage Experimental Farm, a 42-acre tract located south of Logan, is used in cooperation with the U. S. Bureau of Plant Industry, Soils and Agricultural Engineering for study of the improvement of forage plants. Here special attention is given to the development of improved plants for irrigated pastures and for range lands.

The Ogden Substation located in Weber County north of Ogden is a 71 acre tract used for investigations in fruit production.

The Station also owns farm plots near the College and in Washington County, and rents land for experimental purposes in various parts of Utah.

Other investigations not involving land use are conducted throughout the state. Among these may be mentioned the soil survey work; plant disease surveys, problems of injurious insect control; problems connected with land use, agricultural marketing and farm management; studies of the social problems connected with rural living; the gathering of snow survey data, problems connected with irrigation and the surveying of range resources.

The research facilities have a three-fold importance in the institution: First, they make it possible for the teaching faculty to fortify instruction with the results of original research; second, they afford advanced students an opportunity to keep in touch with research methods and facilities; and third, they offer employment to students qualified to act as research assistants or laboratory aids. Between 50 and 100 students thus employed are on Station payrolls each month of the school year. Several find employment in laboratories and on the experimental farms during the summer months.

Major lines of research now in progress include projects in the departments of Agricultural Economics, Agronomy, Animal Husbandry, including Dairy Husbandry, Poultry Husbandry, Veterinary Science, Botany and Plant Pathology, Bacteriology and Public Health, Chemistry, Forestry, Home Economics, Horticulture, Irrigation and Drainage, Landscape Architecture and Planning, Physics, Range Management, Rural Sociology, Vegetable Crops, and Zoology, Entomology and Physiology.

ENGINEERING EXPERIMENT STATION

J. E. CHRISTIANSEN, *Director.*

BY act of the Board of Trustees of the Utah State Agricultural College, December 2, 1918, the Utah State Engineering Experiment Station was established to serve the State in a manner broadly outlined as follows:

(1) To serve those industries and utilities affecting the agricultural and rural populations of the State and to aid public officials and teachers by making engineering investigations of significance and interest to them.

(2) To further the development of methods of processing and use of waste products from agriculture.

(3) To develop methods of processing and making available for use the undeveloped agricultural and industrial raw materials of the State.

(4) To further develop the science of Irrigation and Drainage to the end that the land and water resources of the State may be most fully utilized.

(5) To stimulate a greater use of native materials in rural housing and farm structures.

(6) To develop applications and uses of power equipment and to help solve problems relating to the water supply and sanitation of the farm home.

(7) To develop new tillage, harvesting, and weed control equipment.

(8) To develop new methods and uses of native materials in the construction of farm-to-market roads and highways.

(9) To cooperate with the Federal government in the conducting of investigations along these and other lines of engineering in harmony with the functioning of the Land-Grant College.

(10) To stimulate and elevate engineering education by developing the research spirit in faculty and students.

(11) To publish and distribute through bulletins, circulars, and technical articles in periodicals the results of such studies, surveys, tests, investigations and researches as will be of greatest benefit and interest to the people of Utah.

The Engineering Experiment Station is an integral part of the School of Engineering and Technology, and the laboratory facilities and shops of the School of Engineering are available for the investigational work of the Station to extent of sums allocated for their operation and support.

The Dean of Engineering is Director of the Station, and the staff is composed of members of the teaching staff from the School of Engineering and Technology.

EXTENSION SERVICE

W. W. OWENS, *Director.*

THE Extension Service stands for better farm and home management and better living, with emphasis on the family-sized farm. The income from farming cannot all be measured in terms of cash. Part of it consists of fresh food, comfortable home and pleasant surroundings. The stability of ownership and close contact with nature develop virtues in the farm family which make its members the highest type of American citizens.

To accomplish the above objectives work is planned along the following lines:

1. To increase the net income of the farmer through more efficient production, marketing and use of capital and credit.

2. To promote better homes and a better standard of living on the farm.

3. To develop rural leaders, through short leader training courses on both state and county levels and through individual guidance.

4. To promote the mental, social, recreational, educational and community life of rural people.

5. To help in a program that will add beauty and other living satisfactions to rural homes.

6. To implant a love and appreciation of rural life in farm boys and girls. This is accomplished largely through the program of 4-H Clubs.

7. To enlarge the vision of rural people on national and world affairs.

8. To acquaint the public with the importance of agriculture in the national life.

9. To assist in agricultural marketing and purchasing problems.

The Extension Service works through county and community planning committees, using their studies and recommendations as basis for the Extension program within the county. It also works with all other existing rural organizations to reach the largest possible number of people. Individuals receive personal attention upon request. Assistance is given men, women, boys and girls in farm and home problems. Information on problems of common interest to groups is given in project form, and followed up progressively until satisfactry solutions are found and approved practices established. Information is also disseminated by demonstrations, lectures, film strips, motion pictures, newspaper and magazine articles and pictures, radio news releases and programs and illustrations.

The Extension Service has county agricultural and home demonstration agents in practically every county of the state. Although regular members of the College faculty, the agents live right in their home counties where they are available to help farmers and homemakers at all times. A staff of state Extension Service specialists on the various farm and home problems cooperate closely with the agents and volunteer leaders in assembling information and determining methods of solution to these problems. While the agents must cover the general field of Extension work, it is the job of the specialists to keep up on the latest information and developments in their particular field, then carry these findings to the agents and assist in their application to problems on hand. To do this the specialists cooperate closely with the College Experiment Station, U. S. Department of Agriculture research division, and the Experiment Stations and Extension Services of other states. Of course, many of the new developments come from the counties, that is, from the farmers and the agents. The specialists acquaint themselves with these and apply them elsewhere for the benefit of others. To help carry on the Extension work, voluntary project leaders are selected from the communities and farms and trained by specialists and agents to assist in organizing and leading project groups.

The Extension Service cooperates with the Farm Bureau, the State Department of Agriculture, other state departments dealing with agriculture and homemaking, churches, and all agricultural commodity organizations. It also works closely with all federal agricultural agencies operating within the state. It has a special assignment by federal law, of recruiting, training and placing agricultural labor within the state.

The list of projects carried by the Utah Extension Service Staff follows: Irrigation, fertilizers, crop improvement, range reseeding, land use, erosion control, farm management, weed control, rodent control, insect control, plant disease control, farm forestry, fire control, horticulture, gardens, labor utilization, livestock management, breeding, feeding, bull grading, production records, dairying, dairy manufacturing, wool production, poultry, animal disease and parasite control, farm buildings, farm accounting, farm machinery, marketing, foods and nutrition, clothing, home furnishings, home management, home accounts, health, electrification, landscaping, civic improvements, savings and investments, 4-H work with youth, leader training.

To help with its educational work among Utah's rural families, the Extension Service conducts a number of annual schools on the College campus for farmers and homemakers. These are free, non-credit short courses, on such subjects as 4-H leaders' training, dairying, crops, poultry, livestock, soil conservation, marketing, etc. Extension Service personnel, resident College faculty members, and other authorities on the particular subject being taught, conduct these classes. The Extension Service maintains its own building, known as the Rural Arts building, on the College campus, in which to hold these schools and house the people attending them. A large portion of the funds with which to construct the Rural Arts Building was contributed by county commissions and rural families, upon request of the Extension Service. It was built with NYA (National Youth Administration) labor at considerably less cost than would otherwise have been entailed. Meals while attending the schools may be obtained at the College cafetria in the Commons building.

EXTENSION CLASSES, HOME STUDY, BUREAU OF VISUAL AIDS IN EDUCATION

L. G. NOBLE, *Director.*

UTAH State Agricultural College through the Extension Class Program, Home Study Courses and Visual Aids in Education is prepared to give assistance to individuals and community groups interested in educational and cultural programs.

EXTENSION CLASSES. Extension Classes are offered in practically all subjects. In-service helps to teachers are available in every department including classes for the renewal of teaching certificates. Classes will also be provided in vocational fields and for special-study groups.

Invitation to Learning: A series of book reviews and special lectures is being prepared and will be available to the public at the opening of the College in September, 1947. These reviews will center around the great books of the past and the present and will afford opportunity for study and discussion of the important issues before the world.

HOME STUDY. Utah State Agricultural College was one of the first educational institutions of the Intermountain Region to establish a Home Study Department. Correspondence Study furnishes an excellent opportunity for systematic instruction to students of High School or College grade and to all adults who desire to obtain information in selected fields.

Students must be at least nineteen years of age, or must submit fifteen units of high school work, or must be graduates of a high school for admission to Correspondence study courses of college grade. One-fifth of the credits (37) necessary for a degree may be earned through this department.

In the College division a wide variety of subjects is offered in the following departments: Agricultural Economics and Marketing, Agronomy, Animal Husbandry, including Poultry and Dairying, Art, Bacteriology, Business Administration and Accounting, Economics, Education, English, Entomology, Forestry, Geology, Home Economics, History, Horticulture, Irrigation and Drainage, Mathematics, Political Science, Psychology, Public Health and Zoology.

Preparatory or high school courses are offered for those who have been unable to complete their high school courses and who wish to satisfy the entrance requirements of the College and also for those who wish to fit themselves for careers in which the equivalent of a high school education is necessary.

A special catalog of Home Study Courses will be mailed on request.

REGULATIONS GOVERNING EXTENSION WORK

I. GENERAL

All instructors in extension courses are either members of the regular teaching faculty officially assigned to the teaching project concerned, or non-resident members appointed under the procedure customary for faculty appointment in the Institution.

Extension credit courses given by direct class instruction shall:

(a) be equivalent in content, hours of class instruction and preparation, to similar courses offered in residence work,

(b) be subject to the same prerequisites as comparable campus courses, or as the departments may prescribe, including a comprehensive final examination.

II. RESIDENCE COURSES SUPERVISED BY EXTENSION DIVISION

Residence credit shall not be given for off-campus work without special approval of the Deans Council.

Courses carrying extension credit should not exceed 120 minute periods.

Extension classes for graduate students will not be given without special permission of the Graduate School.

III. HOME STUDY COURSES

All home study courses must include a final examination.

Students registered for home study must count this study as part of their total load in case of registration for residence work at the College. If the home study of the residence registration exceeds the maximum amount permitted by the Institution, then the student must obtain the permission of the Attendance and Scholarship Committee to carry this excess load.

Each school of the College, subject to faculty approval, shall determine the nature and the amount of home study credit accepted for admission and toward graduation. In no case shall more than 25 percent of the total number of credit hours accepted for graduation be home study credit.

(For other regulations concerning Extension credits, see section on "Graduation" in introduction of this catalog.)

VISUAL AIDS IN EDUCATION. The service of the Bureau of Visual Education is being made available to all schools, clubs and community groups. At present the Bureau is especially prepared to give service in the fields of Agriculture, Home-making and Recreational Activities. New films on timely topics and subjects are being added to the Library constantly. Individuals and school and community groups are invited to contact the Bureau with their visual education problems.

Catalog information and instructions on how to obtain department films from the various depositories in the United States is available in this office.

SUMMER SESSION

M. R. MERRILL, *Dean.*

FOR more than 30 years the College has conducted Summer School as an important part of its educational program. Since 1924, the offering has been materially enlarged and enriched and a very stimulating lecture course established. The purpose of this large educational undertaking is to bring to Logan, with its delightful summer climate and many recreational features, a number of the leading educators of the nation, and build, in the Intermountain West, a Summer School of wide influence.

During the Summer School nearly all departments of the College offer courses, the program being arranged to meet the particular needs of summer students. The courses offered in Education, Psychology, and related departments make it possible for the students to meet all of the requirements for Utah certification for High Schools, Junior High Schools, and Elementary Schools. The curriculum will also meet practically all of the requirements for certification in surrounding states.

In the past years the majority of summer students have been teachers in secondary and eementary schools. At present an increasing number of regular students are continuing on through the summer. High school graduates are also entering the college immediately rather than postponing entrance to the Fall Quarter. Returning service men and women are particularly interested in a regular summer program inasmuch as nearly all of them wish to complete their education as quickly as possible. The summer curriculum is being arranged to meet this trend. Consequently, practically all of the departments are offering at least part of their regular program during the Summer Quarter.

Graduate Credit

Summer School students are allowed seven years in which to satisfy requirements for the Master of Science degree, but they may complete the requirement for this degree by attendance at three Summer Schools. This makes it possible to secure this degree without giving up present teaching employment. Those who expect to register for work leading to this degree should submit their credits to the dean of the Graduate School several weeks in advance of registration and indicate the subject in which they wish to major. This will make it possible to have the course of study approved at the time of registration.

RELATED INSTRUCTION

C. D. MCERIDE, *Supervisor;* A. L. BEECHER, *Assistant.*

THE Division of Technology, in cooperation with other departments on the campus, offers a program of Related Instruction for Veterans and other employed persons. The purpose of this instruction is to increase the vocational knowledge and civic intelligence of occupational workers. The courses are grouped under three main headings; namely, Commercial, General, and Industrial, and are described in a separate Related Instruction Catalog. While the numbers and titles of the courses as listed in the Related Instruction Catalog are similar to many courses in the regular College catalog, yet the content is designed to apply particularly to employed personnel. Terminal credit is given for these courses. College credit may be obtained by anyone with college standing who satisfactorily completes a Related Instruction course, applies for, and successfully passes the special examinations for the corresponding college course.

The classes are held in the evening and are set up on a clock hour basis. Courses generally run for a period of twelve (12) weeks. Any of the courses listed will be given if ten or more students enroll.

(1) **Commercial Group:** Advertising, Accounting, Business Administration, Business Math, Merchandising, Office Management, Personnel Management, Purchasing, Salesmanship, Secretarial Science, Shorthand, Typewriting.

(2) **General Group:** American Government, Applied Science, Business Law, Commercial Art, Design, Economics, Business and Trade English, Menu Planning, Personal and Public Health, Safety and First Aid, Speech, Vocational Adaptation.

(3) **Industrial Group:** Art Metalry, Automotive Chassis and Steering Correction, Automotive Electricity, Automotive Power Plants, Body and Fender Repair, Building Construction, Cabinet Making, Diesel Engines, Drafting and Blueprint Reading, Electrical Code, Elements of Plumbing, Employee-Employer Relations, Forging, House Wiring, Industrial Electricity, Joinery and Millwork, Machine Shop Practice, Trade Mathematics, Meat Cutting Theory, Metal Refinishing, Motor Tune Up, Painting, Photography, Practical Electricity, Radio, Refrigeration, Textile Chemistry, Upholstering, Welding, Wood Finishing.

RELATED TRADE EXTENSION

The Division of Technology, in cooperation with the U. S. Office of Education and the Utah State Department of Vocational Education, offers a program of Related Trade Extension for journeymen and other skilled workers. This program is separate and distinct from the program of Related Instruction for Veterans. Its offering is limited to short, intensive courses in special problems to meet the specific needs of advanced workers in the industry. For additional information, see the Related Trade Extension Catalog.

BRANCH AGRICULTURAL COLLEGE

H. WAYNE DRIGGS, *Director.*

THE Branch Agricultural College of Utah marks the date 1897 as the year of its founding. Its first service to the state was listed under the title of the Branch Normal School, of the University of Utah. With the growing need in Southern Utah for agricultural development a change of administration at the parent institution was effected in 1913 and the school then became a branch of Utah State Agricultural College. Occasion for additional training for the youth of Southern Utah thus opened. Through new college offerings in Economics, Vocational Industrial Education, Basic Arts and Sciences, Business, Social Sciences and Education young men and women now find increased opportunity to become better home and community builders. Significantly of value is the fact that all Branch Agricultural College courses parallel those of the lower division of the parent institution.

Beginning with 1936-37 school year, the Board of Trustees authorized the addition of Senior Division courses in Agronomy, Animal Husbandry, and Agricultural Economics and related work. This enables students in Agriculture to obtain a B.S. degree in these departments with one year of additional work at Utah State Agricultural College, Logan.

The Extension Service and the Agricultural Experiment Station are closely connected with the B. A. C., and certain members of the resident staff at Cedar City are also members of the staff of these two divisions. The deans of the parent institution supervise closely the work of the corresponding divisions here.

Fifty-fourth
Annual Commencement
List of Graduates 1946-47

GRADUATE SCHOOL

GRADUATES WITH THE DEGREE OF MASTER OF SCIENCE

Andrew, Dean C.	Education
Bacon, David C.	Economics
Briggs, Melvin T.	Sociology
Brough, Owen L., Jr.	Agricultural Economics
Capener, Harold R.	Sociology
Case, Helena B.	Physical Education
Cook, Clyde John	Range Management
Daines, Delva	Education
DeHart, Noble	Animal Husbandry
Fernelius, Byrne C.	Physical Education
Gardner, Walter Hale	Physics
Hall, Vaughn L.	Physical Education
Hansen,Vaughn E.	Civil Engineering
Huber, James Russell	Animal Husbandry
Jacobsen, Jewel	Education
Kerr, Kleon Harding	Education
Leatham, Linden J.	Zoology
Nye, William Preston	Entomology
Perry, Mignon	Clothing, Textiles, and Related Arts
Snow, Cluff D.	Physical Education
Thomson, Walter Barron	Civil Engineering
Thornley, Gwendella	Education
Watt, George D.	Psychology

GRADUATE WITH CERTIFICATE IN SOCIAL WORK

Alder, Karl G.

UNDERGRADUATE DIVISION

GRADUATES WITH THE DEGREE OF BACHELOR OF SCIENCE
SCHOOL OF AGRICULTURE

Allred, Royal N.
Ashton, Wilford Jay
Baird, Bruce Lloyd
Ballard, John Clark
Barratt, Glen Curtis
Beck, James Stephen
Becker, David William
Blanchard, Daren B.
Bradfield, Darwin E.
Bradshaw, Clare N.
Bringhurst, Royce S.
Bush, Richard Andrew
Clayburn, L. Dee
Condie, Ray C.
Dennis, Danniel Stewart
Forsyth, J. LeGrand
Francom, Farrel J.
Glenn, Joseph Melvin
Hall, Jay M.
Hanseen, Robert B.
Hardman, C. Neff
Hyer, Harold Ralph
Jensen, Don Y.
King, Owen L.
Lindsay, Harold Glenn
Manning, J. Howard
Maughan, Dale B.
McFall, James L., Jr.
McNeel, Worth B.
Mellor, Jesse Lynn
Memmott, Byron Fenton
Mickelsen, Elwood R.
Myers, Jay Newbern
Nelson, Leland Keith
Nelson, Woodrow Ensign
Nielson, Arlo E.
Nielson, Glen Lyman
Nielson, Rex F.
Noyes, John Keith
Ormond, Na Ray Henry
Peterson, Gene Charles
Peterson, Shirley D.
Powell, Calvin Cox
Pratt, Parker F.
Quayle, Douglas H.
Robins, Fred I.
Seely, John G.
Seely, Preston D.
Shumway, Richard Phil
Staples, George Emmett
Taft, Karl M.
Taylor, Arnold
Taylor, Dell Elwin
Taylor, Thomas Harold
Wayman, Oliver
Wendel, Raymond
Williams, Arthur Hughes
Willis, Curtis L.
Wood, James Harlan
Yardley, James Frederick
Yose, Frank A.
Zirker, Kenneth E.

SCHOOL OF ARTS AND SCIENCES

Ackroyd, Alice
Anderson, Dee Ray
Baca M., Jack A.
Baughman, John P.
Beaudoin, Howard S.
Beckstead, Jean
Bell, Jeane S.
Berntson, Roma
Black, Donald M.
Blaser, Glenn Frank
Blood, Howard L.
Brunson, Betty
Bunderson, Veda
Campbell, J. Allan
Chambers, Tacy
Chatelain, Jack Ellis
Coumas, Mary
Galida, Frank R.
Gardner, Margaret Toolson
Geddes, Cleone Hansen
Hadfield, Ross S.
Hadlock, Willard Vern
Hall, Dennis H.
Herrick, Richard Val
Hymas, Theo Alfred
Irick, Roy Calvin
Jacobsen, W. Boyd
Jensen, Bernell
Johansen, Beverly
Larson, J. Lyn
Lawrence, Robert Allen
Leatham, LaVoyle
Lewis, Priscilla
Lundahl, Jenna Vee
Manning, William R.
Maughan, Grant Leishman
Memmott, Ruth Spendlove
Neilson, Frank H.
Nielson, Alma Errol
Nilson, Wanda B.
Norton, George Lawrence
November, Harry John
Pond, Norene Larsen
Robinson, James Eugene
Roskelley, Kathryn
Simpson, Dona Marie
Sorenson, James Charles
Stephens, Verlin Clark
Taylor, Carl Joel
Thomas, Quentin H.
Tingey, Fred H.
Tippetts, Francis Hayward
Tremayne, Roy E.
Veibell, Marie Diana
West, Mary
Wilcox, Elmer W.
Williams, David S., Jr.
Wolf, Ernest W., Jr.

SCHOOL OF COMMERCE

Allen, Alene
Allen, Norman J.
Allred, Wells M.
Anderson, Donald Orren
Anderson, Joseph A., Jr.
Anderson, Nathan Hale
Andrews, Wade H.
Bartholomew, Helen Mae
Baugh, Clair Lewis
Bauman, Frank R.
Bennett, William Stewart
Benson, Jacque M.
Berntson, Ariel James, Jr.
Bishop, Theral Vernon
Black, Joseph E.
Calderwood, Curt E.
Caldwell, Gaylon L.
Chatwin, Willis R.
Clark, Kathleen Jane
Cleveland, Genese
Clyde, Ruth
Coleman, Franklyn Robey
Cooper, Roy
Daines, Patricia Ann
Daines, Ursula D.
Dance, David O.
Davis, Jack R.
Edison, Louis Hal
Eldredge, Vernon D.
Garff, Orson Reed
Garr, Cyril Delore
Geddes, Grace Elizabeth
Gudmundson, Serge B.
Gunn, Wilma
Hall, Reid Jenkins
Hanseen, Melba S.
Hansen, Eldon W.
Hansen, Sherma
Hanson, Hyrum E., Jr.
Iverson, Dwayne J.
Izatt, Margaret Jane
Jacques, Spencer
Jenkins, Lynn E.
Jeppson, Norman P.
Jones, Garth N.
Kowalski, Thomas M.
Larsen, Marion R.
Lund, Gordon Lee
MacDonald, LaMont G.
MacGinnis, Joseph E.
McBride, Claude E.
McBride, Conrad LeGrande
Mouritsen, Helen M.
Munk, Veda Mae
Munns, Ellen Mae
Owens, Owen Waite
Paulsen, Frank Robert
Pocock, Twylla
Reynolds, Henry J.
Robinson, Foss H.
Skeen, Evan F.
Sonne, Patricia Hatch
Spencer, David William
Stevenson, Mary
Swenson, George F.
Terry, Robert Henry
Thornley, Willard DeAlton
Wilsen, Burke Johnson
Wilson, Ramon
Yorgason, Charles Elden
Yorgason, Rulon J.

SCHOOL OF EDUCATION

Anderson, Grant Lester
Archibald, Duane W.
Armstrong, Ruth Mae N.
Ashcroft, Eunice
Baker, Omeara Olsen
Banks, Donna
Barber, Helen Flint
Bingham, Riley
Binnie, Margaret Ellen
Blair, Marian
Brown, H. Jess
Buckmaster, George H.
Budge, Rex R.
Caputo, Nick P.
Christensen, Allis C.
Christensen, Mary Elaine
Clark, Lula
Clayton, Maurice
Clayton, Ruth Vickers
Cooper, Beulah
Cordon, Forrest C.
Cox, Anna
Dahlquist, Don
Davis, Thomas M.
Dobson, William Ralph
Doutre, Georgene
Downing, Lester Norman
Egbert, Robert Lindsay
Farrell, Kenneth A.
Fletcher, Susette
Fonnesbeck, Eunice
Freeman, Dwight C.
Gardner, Eva H.
Geddes, Moselle
Gilgen, Chester M.
Gowans, George H.
Griffiths, Wilma M. A.
Halliday, Jack R.
Hanson, Mae
Hansen, Wilma Annette
Hardy, Norwood
Hawkes, Yvonne Merrill
Hendricks, Bessie T.
Hess, Kathryn H.
Hill, Dorothy Ann
Hobbs, Donald J.
Holmes, Maude Alice
Homer, Louise
Horton, Jack E.
Howard, Lorenzo M., Jr.
Johnsen, Clarke N.
Johnson, Arthur Carlson
Johnson, John Russell
Johnston, John Earl
Jones, Naomi Nielsen
Jones, Olive Grace Lewis
Killpack, Marjorie Reid
Laney, Ella May
Leston, Chris
Loosle, Byron Stratford
Lowe, Sara Christensen
Macfarlane, Sterling R.
Mangum, Claud D.
Marshall, Jeane Lucile
Matthews, Bill J.
Maughan, Ralph B.
McKay, Janice
Nelson, Beverly
Nielsen, Clayton Christian
Olsen, Grace M.
Reddish, Mae
Reynolds, Don A.
Robbins, F. Dale
Robinson, George Baker
Schwab, Nephi G.
Shaw, Jack
Simpson, Ruth
Smedley, Helen Brunson
Smith, Vernon W.
Sonderegger, Ferron W.
Sorenson, Evan J.
Steed, Loa N.
Terry, Glen C.
Wankier, Udell A.
Waterman, Jean
Watkins, Merrill E.
Whaley, Bert Allen
Wheeler, Bessie
Wheeler, Fontella
Wiggins, Evelyn La Verne
Wilkes, Woodrow Eldon
Williams, James Jardine
Wood, Melvin H.
Ziebarth, Jessie Kathryn

SCHOOL OF ENGINEERING

Agricultural Engineering

Pearson, Gregory L.

Civil Engineering

Barton, Cliff S.
Boyson, Bert
Caseman, Austin Bert
Christensen, Rulon C.
Coulter, Forrest H.
Davis, Sterling
Hickman, Louis Cardon
Leatham, Warren J.
Litz, Leon E.
Lyman, Almon P.
Marsden, William W.
Olafson, Ellaf Arni
Shumway, Lafe K.
Simons, Daryl B.
Van Orman, Stanley H.
Waldron, Lorin Kay

Industrial Division

Allred, Edgar Israelsen
Anderson, Glenn Eldon
Athay, Dean J.
Athay, Russell Grant
Eldredge, Arnold Loraine
French, Lenwood Eugene
Harding, Lewis
Hardy, Eugene A.
Hoffman, Grant Andersen
Jarrett, William R.
Lind, Lloyd C.
Loveless, Austin G.
Neilson, Jay C.
Olesen, Burnhardt D.
Parker, DeRay
Pearce, Douglas M.
Perkins, Joseph W.
Powell, C. Emerson
Ralphs, Lee W.
Salisbury, Darwin LeRoy
Skidmore, James Burnham
Steed, Eugene C.
Wasden, Jed William

SCHOOL OF FOREST, RANGE AND WILDLIFE MANAGEMENT

Brown, DeAlton Thomas
Cram, Delbert D.
Erickson, H. Keith
Gray, James Robert
Haacke, Edwin Dwain
Hayes, Charles Ray
Jensen, R. Zen
Maloney, Elwood W.
Miller, August Wendell
Pinkard, Jacques Jordan
Roberts, Merrill Joseph
Silcock, Burton W.
Wallmo, Olof Charles
Wilde, Lawrence Dare, Jr.
Williams, Grant G.
Winsor, Luther S.

SCHOOL OF HOME ECONOMICS

Alder, Wetona
Anderson, Reva Mae
Auger, Cleda
Baird, Rachel Ann
Bartholomew, HylaMae R.
Bassett, Zella Anderson
Bateman, Afton Nyman
Bennion, Marian
Bergeson, Rosaland
Berrey, Jean
Bingham, Hazel
Cowley, Carol
Danielson, Afton
Dean, Shirley
Draper, La Wauna
Forrest, Barbara Jean
Fullmer, Georgia Beth
Griffiths, Gretta
Hansen, Chloe
Hurst, Katherine
Jensen, Dorothy Christine
Johnson, Margene Hall
Klomp, Betty Jean
Larsen, Halcyon D.
Larson, Phyllis Sederholm
Liechty, Melba Ann
Lovell, Merlene
Macfarlane, Miariam
Newey, Kathleen Grant
Nichols, Lorraine Cunningham
Nogami, Namiye
Pendleton, Donna Bertin
Perkins, Virginia H.
Redd, Colleen
Richards, Jean
Robson, Maurine
Salisbury, Lorna Grix
Shumway, Loa Jean T.
Silver, Ruth S.
Skabelund, Lorraine P.
Thomas, Phyllis May
Thompson, Iva Lou
Whitesides, Adra Beth
Zollinger, Blanche

GRADUATES WITH THE SPECIAL CERTIFICATE
INDUSTRIES AND TRADES

Allen, Ira R.
Black, Roscoe
Forsberg, Golden
Garrard, David W.
Johansen, Neldon R.
Larson, Roy D.
Swenson, Dale Lee
Wood, Edwin L.

SUMMARY OF ATTENDANCE

Regular Academic Year

September 27, 1946 to June 6, 1947

RANK	AGRICULTURE		FOR-ESTRY	ARTS & SCIENCES		COMMERCE		EDUCATION		ENGINEERING		HOME EC-ONOMICS	TOTAL
	MEN	WOMEN	MEN	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN	WOMEN	
Graduates	35	1	19	25	5	9	2	29	19	16		4	164
Seniors	79	1	20	43	27	54	23	38	47	48		47	427
Juniors	82		60	53	48	63	38	50	68	85		67	614
Sophomores	127	2	85	87	75	102	42	41	59	181	1	79	881
Freshmen	385	4	266	345	159	234	102	121	96	546	1	134	2393
Total Collegiate	708	8	450	553	314	462	207	279	289	876	2	331	4479
Vocational	1			2	1				3	1	1		9
Totals	709	8	450	555	315	462	207	279	292	877	3	331	4488

(Men, 3332—Women, 1156)

Summer Session and Intersession, 1946 (Men, 982—Women, 270) 1252

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